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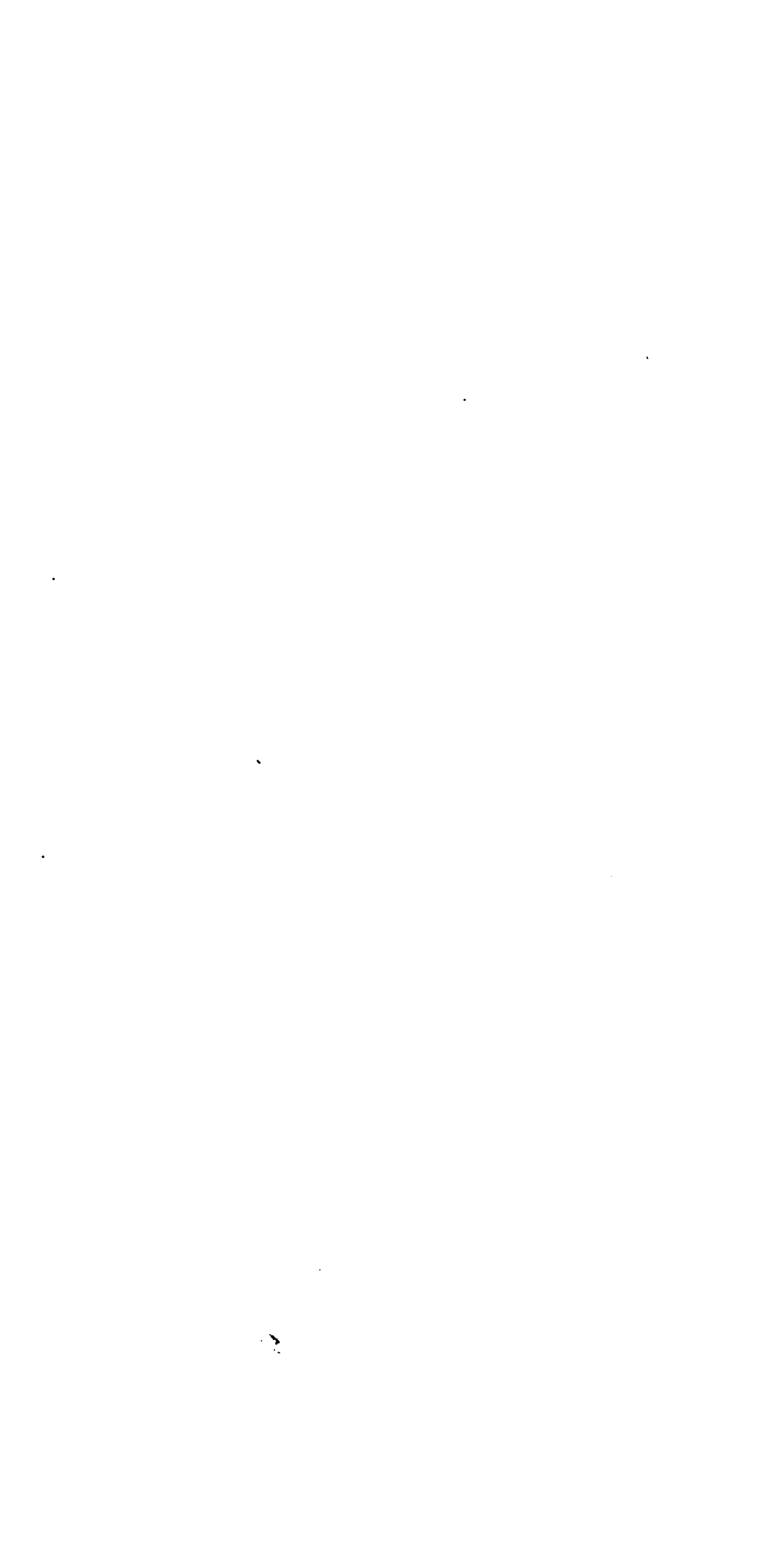
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ARTIS LOGICÆ

RUDIMENTA.



ARTIS LOGICÆ

RUDIMENTA,

FROM

THE TEXT OF ALDRICH,

WITH NOTES AND MARGINAL REFERENCES.

BY THE

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P R E F A C E.

WHATEVER variety of opinion may exist as to the absolute merits of Aldrich's *Logic*, there are many considerations which recommend a new edition of that work, as by far the most convenient mode of supplying an acknowledged deficiency in the studies of the University. The majority of Teachers will probably agree with me in regarding the dry skeleton of a Latin Manual as better adapted to the discipline of beginners than any of the more elegant, but somewhat diluted *Essays* of the present day : to which must be added the consideration, that Latin is the original language of many of the technicalities of the subject, which cannot be so conveniently learned through the medium of a translation. But among the Latin Compendia, that of Aldrich has long reigned almost exclusively in Oxford ; nor would it be easy to select any rival manual of such decided superiority as to counterbalance the evils necessarily attendant on all violent changes in a long-established system. Deficient as the work unde-

niably is in many of the prominent features of the Scholastic Logic, its very deficiencies render it in some respects preferable to a more faithful exponent. The criticism of the present age has contributed much towards a more just appreciation of the merits of the mediæval Philosophy; but he must be a bold champion of reaction who would advocate the complete disinterment of the Logic of the Schools. Who would desire now to oppress the Student with the heavy burden of modals, or to bewilder him with the mysteries of *Suppositio*, *Ampliatio*, *Restrictio*, and the whole farrago of the *Parva Logicalia*? Omissions of this character may, with equal probability and more charity, be attributed to the sound judgment of the University, than to the decline of the Professorial System and the incompetency of College Tutors*.

On the other hand, it must be confessed that there is much to be added to this or any other Compendium, to enable it to meet the demands of the existing University Examinations. This will at once be admitted by all who have had any recent practice in tuition; it may be easily ascertained by any who will take the trouble of comparing the contents of the book with those of any of the present examination-papers. To this deficiency, the increasing study of the original writings of Aristotle has not a little contributed. But the transition from the bare text of Aldrich to

* See Edinburgh Review, No. 115. p. 195.

that of Aristotle is far too abrupt to be beneficial to the Student. Occasionally indeed he may recognise an old friend in a new dress; but the difference of language, order, and manner of treatment will conceal from the unpractised eye most of the passages in which his Latin successors have attempted any thing more than a bare translation of the words of the Stagirite.

In this respect, it is hoped that the numerous references to, and quotations from, the *Organon*, which will be found in the following pages, will contribute in some degree towards a most important object,—the clear discrimination between those portions of the system which belong to the original work of Aristotle, and those for which we are indebted to subsequent Logicians. For a like reason, in my references to the latter, I have occasionally endeavoured to furnish some information as to the author and the period of the innovation. Nothing is more strongly to be reprehended than the slovenly practice of referring in general terms to the *Logic of the Schoolmen*; as if every individual of that body had written a distinct treatise on the subject, or as if those who have were a race of harmonious commentators, whose labours exhibit a supernatural uniformity, such as tradition narrates of the translators of the *Septuagint*. What would be thought of a reference in general terms to the doctrine of the Greek Philosophers? Yet Aristotle scarcely departed more widely from Plato, than

did Abelard from William of Champeaux, or Occam from Scotus. In some cases it is indispensable to the right understanding of doctrines and modes of expression, to know when and by whom they were first introduced into Logic. If, for example, as in the treatment of the Predicables and of Definition, we find language held neither by Aristotle nor by Porphyry, expressly insisted on by one sect of the Schoolmen, and as expressly repudiated by another, there can be no doubt what views, whether right or wrong in themselves, must be adopted as a necessary basis for the interpretation of that language.

Of my own very imperfect acquaintance with the post-Aristotelian Logicians, I am well aware. But when the alternative lies between the postponement of the present work to an almost indefinite period, and the attempting it from such resources as I can at present command, the necessity that has long been felt for something of the kind, will, I trust, be allowed as some apology for the deficiencies of the execution.

One other point remains to be noticed. In commenting, whether for explanation or correction, on the language of a manual so brief as that of Aldrich, there is no tutor but must have felt the difficulty of attaining the happy medium between dogmatic assumption on the one hand and prolix discussion on the other. It is possible so to bewilder a pupil with premises that he shall utterly lose sight of the

conclusion: it is possible so to overwhelm him with assertion, as to leave him no choice but that of blind submission to the *ipse dixit* of his tutor or the *ipse scripsit* of his text-book. The same difficulty meets the editor. In controverting the positions of a work which for more than a century and a half has enjoyed the sanction of the University, somewhat more of the *verecunde dissentio* is becoming than can always be comprised within the necessary limits of a foot-note. The further discussion of such points in an Appendix has in some instances unavoidably produced a certain amount of repetition. This however, though injurious to the form of the work, will, it is hoped, not render it the less serviceable to that not inconsiderable class of students

οἷς οὐδὲ τριῖς λέγοντες ἐξιχνεύμεθα.

A few passages omitted in recent editions of the Compendium have been restored in the present. This, however, has been done but sparingly. An account of the *Arbor Porphyriana* has been transferred to the first chapter from its original place in the *Penus Logica*. The obvious utility of the insertion will, it is hoped, warrant the liberty in this single instance taken with the text.

The references to Aristotle have been adapted to the Oxford reprint of Bekker's text. In Germany, a custom seems to be gaining ground of referring to the pages of the Berlin edition, but that work has not been sufficiently circulated

here to make the example convenient to follow. Of the *Isagoge* of Porphyry, Buhle's edition has been used. With the Greek Commentators, my chief acquaintance has been made through the medium of the Berlin Scholia collected by Brandis, to which, as the most accessible edition, reference has been made. Boethius is quoted from the Basel edition of 1570. The other quotations will in most instances speak for themselves.

To the present edition is prefixed a short historical account of logical writers, ancient and modern, which, though necessarily cursory and incomplete, will, it is hoped, be found more satisfactory than the notices which can be gathered from most English works of a similar character. In this sketch I have derived considerable assistance from the valuable Essay of M. St. Hilaire. Mr. Blakey's elaborate History of Logic has been occasionally consulted; but his principle of classification and examination is too different from mine to enable me to make much use of his labours. My critical views of Logic have recently been published at some length in a separate work. Some apology is perhaps needed for the references to this, which will be found in the following pages, especially in the earlier portion. But I have long been of opinion, that Logic, as generally taught, requires constant illustration from Psychology, and that the earlier part of Aldrich's text in particular is especially liable to be misunderstood

without some such assistance as it was one principal aim of the *Prolegomena Logica* to supply. My obligations in the present work, as in that, to the writings of Kant, of M. Cousin, and of Sir William Hamilton, require special acknowledgment; to these works must be added here the logical works of Professor Trendelenburg, Waitz's excellent edition of the *Organon*, and Biese's "*Philosophie des Aristoteles*."

INTRODUCTION.

ALTHOUGH the writings of Aristotle are the source from which the science of Logic is principally derived, it is remarkable that there is no single name sanctioned by the Stagirite himself, under which can be comprehended either the whole collection of treatises known by the name of the *Organon*, or the whole subject of which they treat. Λογική, as the name of an art or science, is not to be found in his works, and the cognate terms, λογικὴς and λογικῶς, are used in a very different sense from that which has subsequently been given to them^a. The *logical syllogism* of Aristotle is opposed sometimes to the *analytical*, sometimes to the *physical* syllogism; and signifies a process of reasoning from general principles of probability, as distinguished from one of which the principles are elicited by special contemplation of a given object or notion^b. It is therefore opposed, alike to the demonstrative reasoning, in which necessary truths are resolved into the axiomatic principles on which they depend, and to that by which physical phenomena are referred to general laws of nature.

The first use of the term *Logic*, as the name of a science, is probably later than Aristotle, and to be re-

^a Cf. *Anal. Post.* i. 22. 16. i. 24. 11. ii. 8. 3. *Top.* i. 14. 4. *Phys.* iii. 3. 2.

^b See Gassendi, *Logicæ Proœmium init.* Biese, *Philosophie des Aristoteles*, vol. i. p. 133. Waitz, *Organon*, vol. ii. p. 353. Trendelenburg, *Elementa*, p. 47.

ferred to Zeno the Stoic. The division of Philosophy into Logic, Physics, and Ethics, probably originated with this Philosopher*, and the use of the name *Logic* in Cicero is principally in relation to the Stoical doctrines^d. For the application of the term to the contents of the Aristotelian Organon, the Greek commentators upon Aristotle are our earliest extant authority. Alexander of Aphrodisias, the oldest of these whose works have come down to us*, speaks of ἡ λογικὴ καὶ συλλογιστικὴ πραγματεία as containing under it ἀποδεικτικὴ, διαλεκτικὴ, πειραστικὴ, and σοφιστικὴ^e. Here, while *Dialectic* retains its Aristotelian sense, *Logic* is extended so as to include the syllogistic theory in general, and its particular applications to necessary and probable matter. A similar extension of *Dialectic* is found in the commentaries of David the Armenian^f; and Philoponus uses both terms as synonymous, and in the same extent^h.

* Laert. vii. 39. Plutarch, *De Plac. Phil.* i. 1. This division is sometimes attributed to Plato. (Cf. Cicero, *Quæst. Acad.* i. 19. *De Fin.* i. 22. Euseb. *Præp. Evan.* xi. 1. Augustin, *De Civ. Dei*, viii. 4.) But none of the three names occur in any of the extant Platonic writings; and a different division of sciences into *cognitive* and *practical* is intimated by Plato himself, *Polit.* p. 258. Indeed the state of philosophy in Plato's day would hardly allow of the Stoical division being made. Cf. Van Heusde, *Initia Phil. Platon.* p. 41. 117. Aristotle's supposed adoption of the same threefold classification is still more questionable; being founded on a misinterpretation of *Topics*, i. 14. 4. and at variance, as well with the earliest commentary on that passage, as with Aristotle's constant use of the word *λογικός*, and with his well known division of theoretical Philosophy into Physics, Mathematics, and Theology.

^d *Tusc. Quæst.* iv. 33. Cf. Trendelenburg, *Elementa*, p. 47.

* The Paraphrase on the Ethics, attributed to his predecessor Andronicus Rhodius, is spurious. Its real author is probably Heliodorus Prussensis. See Sainte-Croix, *Examen Critique des Anciens Histoires d'Alexandre le Grand*, p. 524.

^f *Scholias*, p. 141. a. 19. The testimony of Boethius (*In Top. Cic.* p. 766.) would seem to refer this usage of the word to the elder Peripatetics, but we must reject his reference to Aristotle.

^g *Scholias*, p. 18. a. 34. Waitz, vol. ii. p. 437.

^h *Scholias*, p. 143. a. 4.

Two names sanctioned by Aristotle are applicable to parts, but to parts only, of the Organon. These are *Analytic* and *Dialectic*. The former term is applied by Aristotle to the four books which treat of the syllogism and of demonstration¹, and appears to denote the resolution of the reasoning process into its scientific forms. This word is the most nearly synonymous with the modern *Logic* of any used by Aristotle himself; but it embraces the process of Reasoning only, to the exclusion of Conception and Judgment². *Dialectic* is a word probably invented by Plato³, though afterwards applied to the works of earlier philosophers, e. g. Zeno the Eleatic. In its Platonic sense it denoted the highest of all sciences; that which takes cognisance of the eternal and immutable, of being in general and its attributes, and thus has insight into the universal principles upon which all other knowledge is dependent⁴. It thus corresponds in matter, though different in form, with the first Philosophy or Theology of Aristotle, afterwards called Metaphysics. The name Dialectic had reference

¹ Galen (*de libris propriis*, ch. 11.) says that the title *Analytica* is not Aristotelian; the Prior Analytics being called by their author *περὶ συλλογισμοῦ*, and the Posterior, *περὶ ἀποδείξεως*. This testimony is accepted by M. St. Hilaire, *Memoire*, p. 42. But the name *ἀναλυτικά* occurs too frequently in Aristotle's own writings to warrant this view, unless we suppose (which is very improbable) that all the references have been interpolated by a later hand. Cf. Waitz, vol. i. p. 367. The distinction, however, between Prior and Posterior Analytics is not recognised by Aristotle, and we may perhaps conjecture that the name *ἀναλυτικά* was given by him to the entire four books, each division being also distinguished by its own title, as mentioned by Galen.

² Cf. *An. Pr.* i. 33. 2. *Τοὺς γεγενημένους συλλογισμοὺς ἀναλύνειν εἰς τὰ προειρημένα σχήματα*. Cf. Trendelenburg, *Elementa*, p. 47. Waitz, vol. i. p. 366. The *analytical method* of inquiry, attributed to Plato by Laertius, iii. 24. is his method of division, exemplified especially in the *Sophistes* and *Politicus*; though he does not give it the name of analysis.

³ See *Phædrus*, p. 266. Laert. iii. 24. Cousin's Plato, vol. vi. p. 450.

⁴ *Phædrus*, p. 276. *Sophist.* p. 253. *Repub.* vi. p. 510 sqq. vii. p. 521. 534. Cf. Van Heusde, *Initia*, p. 247.

to the colloquial form, which, whether in solitary meditation, or in conversation with others, Plato regarded as the true method of eliciting and communicating knowledgeⁿ; a view intimately connected with his doctrine of ideas, and with the theory which placed all knowledge in reminiscence. The Dialectic of Aristotle holds a far lower position, being merely the act of disputing by question; of attacking and defending a given thesis from principles of mere probability, such as the opinions of men in general, or of the majority, or of certain eminent authorities. The *Dialectical Syllogism* is thus the same as the *Logical*; and the names Logic and Dialectic, if used solely in conformity with Aristotle's authority, would correspond, not to the *Organon* as a whole, but only to the two last treatises, the *Topics* and *Sophistic Refutations*^o.

Thus much may suffice, as regards the origin and use of the name Logic and the cognate terms. More important is the inquiry, to what extent the science itself, as exhibited in Aristotle, is indebted to the labours of previous philosophers. Dialectic, the thing though probably not the name, is regarded, on the authority of Aristotle, as the invention of Zeno the Eleatic^p. By this is probably only meant that Zeno was the first to employ dialogue as the medium of philosophical instruction; his predecessors of the same school, Xenophanes and Parmenides, having communicated their doctrines in verse. The dialectic method was afterwards extensively used by different schools, and for different purposes, which ultimately obtained distinctive names.

ⁿ *Theæt.* p. 189. *Soph.* p. 263. *Phædrus*, p. 275. *Protag.* p. 329.

^o *Top.* i. 1. 2.

^p Laert. ix. 25. But in another passage (iii. 48.) he quotes Aristotle, as attributing the first written dialogues to Alexamenus of Styra. See Athenæus, xi. 102.

Aristotle enumerates four different kinds of reasoning, to which the colloquial form (τὸ διαλέγεσθαι) was applied, λόγοι διδασκαλικοί, διαλεκτικοί, πειραστικοί, and ἐριστικοί¹. The first are demonstrative reasonings, from the proper and axiomatic principles of a given subject. The second, or dialectic reasonings in the Aristotelian sense of the term, are those derived from general principles of probability, such as the opinions of the majority of mankind, or of philosophers. The third are only a special application of probable reasonings to expose the ignorance of pretenders in science². The fourth are fallacious reasonings, from apparent but not real probabilities. In a subsequent passage, he distinguishes between ἐριστικοί and σοφιστικοί; the former being such as employ fallacy merely for a display of skill; the latter, for pecuniary profit. Hence he defines σοφιστική as χρηματιστική τις ἀπὸ σοφίας φαινομένης³. These distinctions however will be of comparatively late origin; after the various applications of the original method of Zeno had rendered specific names necessary.

The eristic or sophistic was, as might naturally be expected, the earliest of these special developments of the dialectic method. The arguments of Zeno himself had no small affinity to sophistry; and the state of philosophy at that period was such as naturally to promote further advance in the same direction. The conflicting opinions of the three great pre-Socratic schools, the Ionian, the Pythagorean, and the Eleatic; the one-sided and exclusive character of their principles,

¹ Soph. Elench. 2. 1.

² *Kritik des dialektischen Scheins*, Kant, *Kritik der r. V.* p. 64. Kant is unjust to the ancient dialectic, when he describes it as a sophistical art of giving illusion the appearance of truth. The tentative use of dialectic very nearly corresponded with his own.

³ Soph. Elench. 11. 1. 5.

combined with the universality of their aims, and the consequent failure of each in the attempt to resolve difficulties beyond their respective provinces—all this could hardly fail to produce a spirit of scepticism, which should end in denying the possibility of attaining to truth at all¹. Such was the purpose of the eristic method of the Sophists. They employed it chiefly to enforce their leading dogma of the unreality of all knowledge, speculative or practical. Accordingly, they endeavoured, by ingenious applications of the dialectic mode of reasoning, to involve those with whom they disputed in self-contradictions and absurdities; and thus to shew that, whatever principles we start from, paradox and inconsistency will be the invariable result. At a later period, the eristic method was adopted and pursued to a considerable extent by Euclid of Megara, and his successors Eubulides, Diodorus Cronus, Alexinus, and Stilpo.

On the other hand, the method of Socrates partook largely of the *πειραστική*, or tentative, which Aristotle describes as follows, *ἡ γὰρ πειραστική ἐστὶ διαλεκτική τις καὶ θεωρεῖ οὐ τὸν εἰδόμενον ἀλλὰ τὸν ἀγνοοῦντα καὶ προσποιούμενον*. The opinion which Socrates entertained of the professions of his contemporaries appears in his well-known explanation of the oracle which pronounced him the wisest of men²; and the same conviction and exposure of ignorance and pretension constantly appear in the Platonic dialogues, as well as in the *Memorabilia* of Xenophon³. For this purpose, he insists on the superior fitness of his own brief discourses to the longer mode of reasoning employed by some of the Sophists, and says that many orators can discourse ably at length, but that,

¹ See Plato, *Theæt.* p. 152. *Cratyl.* p. 386. 402. Van Heusde, *Initia*, p. 121.

² Plato, *Apol.* p. 21.

³ Cf. Plato, *Sophist.* p. 230, Xenoph. *Mem.* iii. 6. §. 2—6.

if examined by searching questions, they are like written books, unable to reply'. In the same spirit, like Descartes in modern times, he urges the necessity of a purification of the mind from prejudice and false opinions, as a necessary preliminary to the investigation of truth; the principal means of purification being Dialectic¹.

In all this, as well as in the Dialectic of Plato, we find no anticipation of any important part of the Aristotelian Analytic; though the various modifications of the dialectic form may have contributed more or less to that systematized method of disputation exhibited in the two last treatises of the Organon. The antecedents of Aristotle's more strictly logical labours appear in other and more subordinate points of the philosophy of his predecessors. We may pass over, as unquestionably forgeries of a later period, the Categories attributed to Archytas, and the other logical relics of the Pythagorean school². There remain two important logical discoveries attributed by Aristotle to Socrates, Induction and Definition³. The Induction, however, of Socrates is not, like that of Aristotle, a strictly formal process of reasoning from the aggregate of particulars to the universal constituted by them. It rather resembles the Aristotelian Example or Parable⁴, being a material inference from a selected number of similar or analogous cases to another individual instance under discussion. As a specimen, may be taken the following argument from the Gorgias. ΣΩ. Τί οὖν; ὁ τὰ τεκτονικὰ μεμαθηκὼς τεκτονικός, ἢ οὐ; ΓΟΡ. Ναί. ΣΩ. Οὐκοῦν καὶ ὁ τὰ μουσικὰ

¹ *Phædrus*, p. 275. *Protag.* p. 329.

² *Theat.* p. 150. Cf. *Sophist.* p. 230. where the Socratic method is ascribed, though Socrates is not the speaker.

³ See Hamilton's Reid, p. 686.

⁴ *Metaph.* xii. 4, 5. Δύο γάρ ἐστιν ἃ τις ἂν ἀποδοίη Σωκράτει δικαίως, τοὺς ἐπ' ἐπακτικούς λόγους καὶ τὸ ὀρίζεσθαι καθόλου.

⁵ *Arist. Rhet.* ii. 20. 4. Παραβολή δὲ τὰ Σωκρατικά.

μουσικός; GOP. Ναί. ΣΩ. Καὶ ὁ τὰ ἱατρικὰ ἱατρικός; καὶ τᾶλλα οὕτω κατὰ τὸν αὐτὸν λόγον· ὁ μεμαθηκώς ἕκαστα τοιοῦτός ἐστιν ὅσον ἡ ἐπιστήμη ἕκαστον ἀπεργάζεται; GOP. Πάνυ γε. ΣΩ. Οὐκοῦν κατὰ τοῦτον τὸν λόγον καὶ ὁ τὰ δίκαια μεμαθηκώς δίκαιος; GOP. Πάντως δήπου^d. A reasoning of this kind has no place in a system of Formal Logic. That science recognises no inference that is not necessitated by the laws of thought; whereas in instances like the above, it is obvious that the premises may be true, and yet the conclusion false^e. Or two specimens may be found, both complying with the above form, one of which shall carry conviction to every reasonable man, while the other is utterly worthless. Its *moral* force may thus vary "from the highest moral certainty to the very lowest presumption^f." Its *logical* value is zero.

The Definition of Socrates has also more of a material than a logical character. He continually distinguishes between the essence and the qualities of a thing, and insists on determining what a thing *is*, rather than what it *resembles*^g; a distinction afterwards repudiated by his disciple Antisthenes, who denied the possibility of real definition. But Definition, as treated by Socrates, is a contribution, not to Logic, but to Metaphysics. It does not analyse by the laws of pure thought the contents of a given notion; but endeavours to penetrate the real essence of things^h. The same may in some degree be said of the Aristotelian treatment of Definition in the Posterior Analytics.

From the position constantly assigned to Socrates in

^d *Gorgias*, p. 460.

^e Of which the above example is adduced as a specimen by Boethius, *Opera*, p. 600.

^f Butler, Introduction to Analogy.

^g Cf. *Gorgias*, p. 448. *Theat.* p. 146.

^h Cf. Fries, *System der Logik*, §. 3.

the Platonic Dialogues, it is impossible to determine with any accuracy how much of the doctrines and methods advocated in those writings is due to the master, and how much has been added by his disciple. From the express testimony of Aristotle, however, we may conclude that Socrates did not, like Plato, maintain the existence of ideas separate from the sensible phenomena of the world¹; and consequently, that the exaltation of Dialectic from its tentative use to the rank of the science of absolute being, a view intimately connected with the ideal theory, is due to Plato rather than to Socrates. To Plato also probably belong in a great degree the methods of *συναγωγή* and *διαίρεσις*, mentioned in the *Phædrus* as the two principal parts of Dialectic, and illustrated at some length in the *Sophistes* and the *Politicus*². The former consists in the collection of a number of scattered objects, in reference to one idea, with a view to definition; the latter in a gradual dichotomy, by means of contrary or contradictory members, so as to ascertain as accurately as possible the number of subordinate species contained under each genus. It is the careful performance of this process, proceeding gradually through the intermediate classes to the lowest, that especially distinguishes the true dialectic method from the eristic³. These processes, for which Plato was perhaps in some degree indebted to the Eleatic and Megaric Philosophy⁴, may be regarded as the precursors of the Aristotelian doctrine of searching for definitions by the two opposite methods, afterwards known as those of Division and Induction⁵.

¹ *Metaph.* xii. 4. 5. 'Ἄλλ' ὁ μὲν Σωκράτης τὰ καθόλου οὐ χωριστὰ ἐποίησεν οὐδὲ τοὺς ὀρισμούς· οἱ δ' ἐχώρισαν, καὶ τὰ τοιαῦτα τῶν ὄντων ἰδέας προσηγόρευσαν.

² *Phædrus*, p. 265. 277. *Soph.* p. 218. *Polit.* p. 262. *Phileb.* p. 16.

³ *Phileb.* p. 17. With this may be compared Bacon's aphorism on the importance of *axiomata media*. *Nov. Org.* l. i. aph. 19.

⁴ Cf. Stallbaum, *Prolegomena in Philebum*, p. 16.

⁵ See *Anal. Post.* ii. 13. and Appendix, note C.

In Plato we find also the analysis of the Proposition, with the noun and the verb as its constituent elements; the union of the two being necessary to every assertion. Διάνοια and λόγος correspond to each other as the *ὁ ἔσω* and *ὁ ἔξω λόγος* of Aristotle; the former being internal discourse without speech, the latter external, by the voice. Λόγος is divided into φάσις and ἀπόφασις^o. In this passage, Plato has furnished the groundwork of the grammatical researches of the *De Interpretatione*.

The three highest laws of thought, the Principles of Identity, Contradiction, and Excluded Middle, are also indicated, though not explicitly enunciated, in Plato^p. But neither he nor Aristotle has accurately distinguished between their very different positions in Logic and in Metaphysics. Indeed, this distinction cannot be considered as having been made with exactness by any philosopher before Kant.

Some few elements of the Logic of Aristotle thus appear in the philosophy of his predecessors; though the science was not accurately distinguished either from Grammar or from Metaphysics. A distinct treatment of logical questions was undeniably first undertaken by the Stagirite; though still, if we regard the *Organon* as a single work, with a considerable admixture of extraneous matters, which a more accurate classification of the sciences would relegate to Metaphysics, to Psychology, to Rhetoric, or to Grammar. But Aristotle must not be considered as responsible for the present composition of the *Organon*, but only for six distinct treatises, which

^o *Sophist.* p. 282.

^p The Principle of Identity may be gathered from the *Sophistes*, p. 254; those of Contradiction and Excluded Middle, from the *Phædo*, p. 103. and the *Sophistes*, p. 252. 250. The two latter principles also appear in the *Second Alcibiades*, p. 139; but this dialogue is generally allowed to be spurious. Aristotle enunciates them more distinctly, *Anal. Pr.* ii. 2. *Anal. Post.* i. 11. i. 2. ii. 13. *Metaph.* iii. 3. x. 5. iii. 7. ix. 4.

his commentators have combined into one volume¹. Of these, the latter part of the *De Interpretatione* and the *Prior Analytics* may be regarded as containing most of the essential parts of pure Logic; though, as regards the laws and forms of judgment in some degree, and of conception almost entirely, much must be added and much retrenched, before we can bring the entire products of pure thought into harmony with the elaborate development of the various forms of the syllogism. The treatise on the *Categories*, with the early part of the *De Interpretatione*, is grammatical rather than logical, with a few trespasses on the domain of Metaphysics; while the *Posterior Analytics*, together with the *Topics* and *Sophistic Refutations*, contain applications of Logic to necessary and contingent matter in demonstration and dialectic disputation, and should be accurately classed rather as parts of the *Logica utens* than of the *Logica docens*. But we are not justified in criticising the *Organon* of Aristotle as though it were a single work composed on a single subject.

Of the post-Aristotelian Logicians, my limits will only allow a very brief notice. To Theophrastus is attributed the invention of the Hypothetical Syllogism, which was afterwards more fully developed by Eudemus and the Stoics. The Stoics have already been noticed as the probable authors of the name *Logic*, and of the division of philosophy into Logic, Physics, and Ethics. The Stoical Logic, while it had less admixture of Metaphysics than the Aristotelian², embraced on the other hand considerably more of Grammar and of Rhetoric.

¹ On the composition of the *Organon*, some further remarks will be found, *Prolegomena Logica*, p. 261. The name *Organon*, according to M. St. Hilaire, was not habitually given to the collected works before the 15th century. *Mémoire*, vol. i. p. 19.

² See Trendelenburg, *Logische Untersuchungen*, vol. i. p. 21.

It was divided into two parts, Dialectic and Rhetoric, to which some added a third, the *ἐξήκον* or doctrine of Definition, employed as a criterion of truth*. Their Dialectic, which also contained a considerable mixture of Grammar, was defined as the science of rightly conversing in question and answer, as Rhetoric was that of continuous speech. It is criticised by Cicero, as prolix in the treatment of judgment, deficient in that of invention†. It also, particularly in the hands of Chrysippus, contained many of the same captious sophisms which had occupied the Megaric School. Their Rhetoric contained four parts, Invention, Elocution, Division, and Action. Cicero appears to have entertained no very high opinion of it‡. But of the details of the Stoical Logic very little is known§.

The Epicureans, on the other hand, professed a contempt for Dialectic¶, and regarded Logic, which they called Canonic, merely as an adjunct to physical science. They paid no regard to Syllogism, Induction, or Definition, but confined their logical method to a set of rules for the investigation of physical truth*. A detailed account of these is given by Gassendi, *De Origine Logicæ*, c. 7.

To the Philosophers succeeded the Commentators. These contributed but little new material to logical science, but did a good deal for the explanation and illustration of the text of Aristotle, and assisted in some degree in fixing the language of the science*. The Greek Commentators on the *Organon* are principally valuable to a modern reader, from the interesting histo-

* Diog. Laert. vii. 41.

† *Top.* 6. *De Orat.* ii. 159.

‡ *De Fin.* iv. 7.

§ St. Hilaire, *Mémoire*, vol. ii. p. 185.

¶ Laert. x. 81.

* Trëndelenburg, *Kategorienlehre*, p. 232.

* St. Hilaire, *Mémoire*, vol. ii. p. 123, 145.

rical notices which they furnish of philosophers whose original contributions to the science have perished. Of the extant Greek Commentators, the earliest and best is Alexander of Aphrodisias^b, whose eminence is testified by the title of *the Commentator* (ὁ ἐξηγητής), a title afterwards given to the Arabian Averroes. The school of Greek Commentators extends to the latter part of the sixth century: the principal writers, after Alexander, are Themistius, Ammonius, David the Armenian, Simplicius, and Philoponus.

The only important addition to the *matter* of logical science emanated from the Neo-Platonic school. The *εἰσαγωγή* or Introduction to the Categories, written by Porphyry in the third century, is the original source of the fivefold classification of the Predicables, adopted by most subsequent Logicians. Whether this classification is an improvement on, or consistent with, the Aristotelian doctrine, admits of considerable question^c.

The Greek Abridgments of Aristotle, though in point of chronology they extend below the scholastic period, are in matter rather connected with the preceding series of Commentators. While the Scholastic Logic began in the extreme west of Europe, the Greek Logicians of this class belong entirely to the extreme east, or to Asia. John of Damascus, in the early part of the eighth century, made a brief analysis of the *Isagoge* of Porphyry and of the Categories, and is remarkable as

^b Galen, in point of time, is a few years earlier than Alexander, but no important commentary of his is extant. Of the numerous logical writings attributed to him, there remains only a small treatise, *περὶ τῶν παρὰ τὴν λέξιν σοφισμάτων*, the genuineness of which is questionable; to which may be added the *Εἰσαγωγή Διαλεκτική* recently discovered and published by M. Mynas. Neither is of any great logical value. Galen's invention of the fourth figure of Syllogism (attributed to him by Averroes) is doubtful. See below p. 75. note x.

^c See below, p. 28. note q.

one of the first who applied Logic to Theology. Photius, the learned and turbulent Patriarch of Constantinople in the ninth century, was the author of abridgments of the *Categories* and the *De Interpretatione*. Michael Psellus the younger, in the eleventh century, composed a Synopsis of the *Categories* and of Porphyry's Introduction^d. The most remarkable work of this kind is the *Epitome Logica* of Nicephorus Blemmidas, written in the thirteenth century, which contains the earliest instance of that system of logical mnemonics which the schoolmen afterwards brought to such perfection*. This list of Greek Logicians closes with the names of George Pachymeres of Constantinople, author of an abridgment of the *Isagoge* and the *Categories*; and of Leo Magentinus, Metropolitan of Mytilene, author of an Exegesis of the *De Interpretatione*, principally taken from Ammonius, and of Commentaries, some of which are still unpublished. To this list, some have added the name of George of Trebizond; but he, though a Greek by birth, is better known as a resident at Rome, and, as an author, by his Latin translations and abridgments of Aristotle. His name is rather connected with a different phase of philosophy, with the Platonic and Aristotelian controversies in the time of Pope Nicholas V.

The progress of Logic among the Latins presents in one respect a contrast to that among the Greeks. With the latter, the age of abridgments and distinct treatises followed that of commentaries; with the former, it preceded. The earliest work of a logical character in Latin is the abridgment of Aristotle's *Topics* by Cicero; the object of which, however, is rather rhetorical than dialectical. This treatise, which was written from

^d The Synopsis of the *Organon* attributed to Psellus is probably spurious.

* See below, p. 81. and St. Hilaire, *Mémoire*, vol. ii. p. 160. It may be questioned whether the Latin Logicians are indebted to the Greek in this respect. See Sir W. Hamilton's *Discussions*, p. 126, 631*.

memory, differs in many respects considerably from the original. After Cicero, we find nothing but a few allusions to the subject in Quintilian and Aulus Gellius¹, till we come to the short account of the doctrine of the *De Interpretatione* and the *Prior Analytics*, written in the second century by Apuleius. This occurs in the third book of his treatise *De Dogmate Platonis*; and the singular error of attributing the syllogistic theory to Plato has caused the genuineness of this book to be questioned². The only other logical writings in Latin before Boethius, are the two works attributed to St. Augustine; the one, an abridgment of the *Categories*, now generally allowed to be spurious, but probably written about the same period; the other, an unfinished treatise called *Principia Dialectica*, the commencement of an essay on language with a view to disputation. To these must be added the singular allegory of Marci-
 cianus Capella, on the Marriage of Mercury and Philology; a medley of prose and verse, composed probably towards the end of the fifth century. The Seven Liberal Arts, afterwards so celebrated as forming the Trivium and Quadrivium, or Encyclopædia of the middle ages, appear in the following order, Grammar, Dialectic, Rhetoric, Geometry, Arithmetic, Astronomy, and Music³. Dialectic is represented as a female of a sour countenance, holding in her left hand a serpent, and in her right a hook baited with sundry formulæ. She discloses her wisdom by a brief abstract of the Isagoge of Por-

¹ See St. Hilaire, *Mémoire*, vol. ii. p. 165.

² Hildebrand, *De Apuleii Scriptis*, p. xlv.

³ M. St. Hilaire has committed an oversight in citing the division of the seven liberal arts from the *Dialectic* of Augustine. No such division occurs there; though one nearly the same is found in his second Book *De Ordine*, ch. 13. M. Haureau (*de la Philosophie Scholastique*, vol. i. p. 21.) attributes the invention of this classification to Capella, which is hardly reconcileable with the above reference.

phyry and of the first three treatises of Aristotle. This is followed by an account of hypothetical syllogisms; and the lady is about to proceed to an exposition of sophisms, when she is interrupted and very summarily dismissed by Minerva.

Boethius, in the sixth century, is the only commentator proper among the Latins. He has left a considerable number of valuable logical works, viz. two commentaries on the *Isagoge* of Porphyry, one on the *Categories*, two on the *De Interpretatione*, and translations of the other parts of the *Organon*; besides original treatises on the *Categorical and Hypothetical Syllogism*, on *Division*, on *Definition*, and on *Topical Differences*; together with a commentary on the *Topics* of Cicero. His works are of great importance in the history of Logic. They form the connecting link between the Greek and Scholastic writings, and were, with those of Augustine and Capella, the principal authority of subsequent generations, at a time when the Greek language was but little cultivated, and when the original fountains of logical science were consequently inaccessible.

The body of Arabian Commentators derive their appellation from the language in which they wrote: their places of residence were various, and none of them within the limits of Arabia. In fact, the Arabian literature did not arise till after the conquests of the successors of Mahomet had extended the Saracen empire far beyond the boundaries of their original country. Like the later Greek Logicians, the Arabians contributed little original matter to the science; their principal works being either translations, made sometimes from the Greek but more frequently from the earlier Syriac versions, or abridgments and commentaries. Of these the most important are the logical abridgments of Avicenna and Algazel, and especially the voluminous

translations and commentaries of Averroes. A Latin version of the translations of Averroes, made from a Hebrew one, was the principal source from which the earlier Schoolmen derived their knowledge of all the writings of Aristotle, except his logical works, which had been translated by Boethius. This barbarous version continued in use even after a more accurate translation from the original Greek had been made by Thomas Aquinas and William of Moerbeke. The merits of Averroes as a commentator have been variously estimated. Ludovicus Vives speaks of him with great contempt. "Nomen est commentatoris nactus, homo qui in Aristotele enarrando nihil minus explicat quam eum ipsum quem suscipit declarandum." With this may be contrasted the eulogy of Keckermann. "Nemo tam veterum interpretum videri potest proximus Aristotelis menti atque hic Arabs." The modern critic will probably take a middle course between the two. While his commentaries may be pronounced somewhat prolix, and inferior in elucidating the text of Aristotle to those of the Greeks, particularly of his rival commentator Alexander; his general view of the *Organon* and its parts has much of the clearness which distinguishes the abridgments of Avicenna and Algazel¹.

The principal material added by the Arabians to the text of Aristotle is the celebrated distinction between *first* and *second intentions*. This is found in the *Epitome* of the *Categories* by Averroes. It has also been traced to Avicenna². To the Arabians also are probably owing some of the distinguishing features, though certainly not the origin, of the Scholastic Realism.

The period at which the Scholastic Philosophy may be said to have commenced, is a point of considerable dis-

¹ St. Hilaire, *Mémoire*, vol. ii. p. 191.

² See *Smiglecius Logica*, Disp. ii. Qu. 2.

pute. It cannot, like various Greek schools of philosophy, be traced to a single founder; but was the gradual result of a collection of various doctrines and methods of teaching. Some have traced it up to John of Damascus, and even to St. Augustine¹. Some commence with John Scotus Erigena in the ninth century, some with the nominalism of Roscelin in the eleventh²; while by others it has been brought down, at least as far as Theology is concerned, as low as the thirteenth century, the era of Albertus Magnus and Thomas Aquinas³. The name of Schoolmen appears to have been taken from the teachers of the cathedral and conventual schools established by Charlemagne and his successors, and was eventually applied to all who, whether professedly teachers or not, adopted in their writings the method and matter which finally formed the course of education in these and similar establishments. The distinguishing feature of Scholasticism, the union of a theological matter with a dialectical method, is found at least as early as the writings of Lanfranc in the eleventh century. Commencing from this point, Scholasticism may be divided into three periods. 1. Its infancy, extending from the eleventh to the middle of the thirteenth century. 2. Its prime, from the latter period to the middle of the fifteenth. 3. Its decline, extending to the end of the sixteenth century⁴.

The Logic of the Schoolmen is a phrase frequently employed, and often very inaccurately. It is incorrect to apply this name to the various applications of the syllogistic method, in Theology, in Metaphysics, in Physics, or in Psychology. These are merely treatises on their proper subjects, with a somewhat more osten-

¹ Brucker, vol. iii. p. 716.

² Hallam, *Literature of Europe*, vol. i. p. 13.

³ Hampden, *Bampton Lectures*, p. 72.

⁴ Cousin, *Ouvrages d'Abélard*, Introduction, p. lxxv.

tentious display of logical art than has been usual at other periods. But the applications of Logic to reasonings on this or that branch of material science have nothing in them which is more peculiarly the property of the Schoolmen than of any other reasoners. The *Logica utens* is one and the same to all generations of men; all who reason soundly, reason consciously or unconsciously by logical laws, and the open display of the instrument in use does not make it a distinct instrument from that which others employ in a more concealed manner.

A historical account of the Scholastic Logic ought therefore to confine itself to commentaries and treatises expressly on the science; and the scholastic contributions to the matter of Logic should be confined to such additions to the Aristotelian text as have been incorporated into the *Logica docens*. In this respect the Schoolmen did much to fix the technical terms of the science, particularly in respect of the relation of thought to language. Most of the distinctions of the different uses and significations of words are due to them;—distinctions, however, carried to an useless and wearisome minuteness in the grammatical subtleties of the *parva logicalia*. They also contributed considerably to that which is most wanting in Aristotle, an exact conception of the nature and office of Logic; though their definitions were not always consistent with the rest of their treatment; the text of Aristotle being seldom modified to suit the theory of the science. But the most remarkable contribution of this period is to be found in that singular system of logical mnemonics by which, from the time of Petrus Hispanus, nearly all the forms and processes of Logic might be learned by rote and performed almost mechanically, by the aid of a memorial word or line. The controversy between the

Realists and the Nominalists, though introduced into the pages of professedly logical treatises, cannot be regarded as an accession to the science. Its real bearings on the text of Aristotle and Porphyry were not seen by the disputants on either side^p; and the controversy, as conducted by them, must be regarded as a metaphysical excrescence, introduced out of its place in a logical system.

The earliest scholastic writings on Logic proper are those of Abelard, the greater part of which have recently been published for the first time by M. Cousin. They consist of glosses on the original and translated works of Boethius, a fragment on Genera and Species, and a distinct treatise called *Dialectica*^q. The glosses are of little value, but the *Dialectica* is one of the most important monuments of the scholastic philosophy. At first sight it appears to be a commentary; but, though the titles of the work follow Aristotle, Porphyry, and Boethius, it is in many respects an original and independent treatise^r. It appears clearly from these relics that Aristotle was only known in the twelfth century through the translations and commentaries of Boethius.

Contemporary with Abelard was Gilbert de la Porrée, whose *Sex Principia*, an expansion of the six last categories cursorily treated by Aristotle, was adopted in most of the scholastic logical treatises down to the sixteenth century^s.

Towards the end of the twelfth century we come to a work of great importance in the history and philosophy of the scholastic Logic, the *Metalogicus* of John of Salisbury. The work purports to be a

^p See p. 28, note r, and Appendix, note A.

^q A theological treatise called *Sic et Non* is contained in the same volume.

^r Cousin, Introduction, p. xxiii.

^s Haureau, *Philosophie Scholastique*, vol. i. p. 298.

defence of Logic, under which is included Grammar and Rhetoric, against a sciolist of the day, to whom he gives the name of Cornificius¹. It contains an interesting account of the author's own preparation for dialectic studies, notices of the origin of Logic, and a good analysis of the *Organon* with criticisms. Among other points, it is worthy of notice that he considers the Aristotelian doctrine of the predicables, given in the *Topics*, to be preferable to the common account, derived from Porphyry. He highly praises Abelard; and his testimony is the more valuable, as he himself appears to incline to the doctrines of the Realists².

In the second period of Scholasticism, contemporary with Albertus Magnus and Thomas Aquinas, is Petrus Hispanus, raised to the papal chair as John XXI. He died in 1277. His *Summulæ Logicales* may be regarded as the earliest scholastic treatise on Logic which professes to be any thing more than an abridgment of or commentary on portions of the *Organon*. But this work is especially remarkable, as introducing for the first time the memorial verses which form so striking a feature of the Logic of the Schoolmen. Nearly the whole of the ordinary logical mnemonics occur in this treatise, which appears to have had no predecessor, except perhaps the imperfect syllogistic mnemonic of Nicephorus Blemmidas, which was probably unknown to the Author³. The

¹ This name, M. Hauréau explains as follows. "*Cornifex, Cornificius*, signifiera 'celui qui fait des cornes.' Mais de quelles cornes peut-il être ici question? Sans doute de ces *cornua disputationis* dont parle encore Cicéron; ce qu'on appelle, en logique, les cornes d'un dilemme. A ce compte, nos Cornificiens auraient été d'aigres disputeurs, des logiciens acérés, d'intraitables sophistes." *Philosophie Scholastique*, p. 344.

² St. Hilaire, vol. ii. p. 215. His opinions in this respect however are doubtful. See Hauréau, vol. i. p. 354.

³ In the first edition, I mentioned the *Summulæ Logicales* as a translation from the Greek of Psellus. This charge has been made by Keckermann and Buhle; and the two works certainly correspond almost to a word. But

last treatise of the *Summulæ**, called *Parva Logicalia*, contains sundry additions to the text of Aristotle, in the form of dissertations on *suppositio, ampliatio, restrictio, exponibile propositions*, and other subtleties, more ingenious than useful, and belonging rather to Grammar than to Logic. To these are added notices of some popular sophisms, worthy of Eubulides or Chrysippus; which are curious, as shewing that the Scholastic Logic, like the Aristotelian, had its eristic predecessors, whose names the reviving literature of the period has not rescued from oblivion.

We now come to the two chief names in the Scholastic philosophy, Albert of Cologne, surnamed the Great, and his pupil, Thomas Aquinas, known as the Angelic Doctor. These have been called the Plato and Aristotle of Scholasticism; and, as regards the Theology of the Schools, there is some truth in the comparison. The master was the first to combine into a system the unconnected reasonings which formed the beginnings of the School Philosophy. The disciple carried out that system in detail, and elaborated its minutest parts†.

from a communication with which I have been favoured by Sir William Hamilton, I am inclined to think that the reverse is the truth; that the Greek work is in reality translated from the Latin; and of course in that case falsely attributed to Psellus. The author of the *Summulæ* appears to have had very little knowledge of Greek; and in the only mnemonic which occurs in the Greek synopsis (δουλούμεναι ἱλιῖδες παρνασίλου ἐκτρέχουσι), the diphthong would hardly have occurred to an original writer; though a natural substitute for the *Purpurea Iliace Amabimus Edentuli* of the Latin Logicians. Indeed, the name of Psellus appears to have been given on conjecture by the editor, Ehinger. Some remarks on this point will be found in the Discussions on Philosophy, just published by Sir W. Hamilton, p. 126.

† The original edition of the *Summulæ* is divided into two parts; the abridgment of the *Organon* and the *Parva Logicalia*. Subsequent Editors subdivide it into seven treatises. See Hauréau, vol. ii. p. 241.

* *Encyclopædia Metropolitana*, art. *Aquinas*, (by Bishop Hampden,) p. 796.

As a commentator, Albert was the main instrument in introducing the writings of Aristotle into the Schools; his laborious expositions, however, have been frequently corrupted by Platonic and Arabian glosses*. His logical works are comprised in commentaries on the Organon, and treatises on Universals and on Definition. Aquinas has left also commentaries on the Hermeneia and Posterior Analytics; and some independent logical treatises; the principal one being "Summa totius Logicæ," which contains an abstract of the Isagoge of Porphyry and of the first four treatises of the Organon. The Topics and Sophistic Refutations are omitted in this work; but the latter form the basis of a separate treatise on the Fallacies. He has likewise written Opuscula on Demonstration, on Modals, on the four Opposed Terms, on Genus and Accident, and on the Nature of the Syllogism. The directly logical writings of Aquinas do not materially differ from Aristotle. Logic, however, is defined as *scientia rationalis*, and the three operations of the reason are brought within its province. Some of the mnemonic formulæ occur here, as in Hispanus.

John Duns Scotus, the Subtle Doctor, flourished at the end of the thirteenth and the beginning of the fourteenth century. He has commented on the Isagoge of Porphyry, under the title of *De Universalibus*, and on the several parts of the Organon. In common with Aquinas, he held Logic to be a science; but maintains that its object is not the three operations of the reason, but the Syllogism*. His commentaries bear out his cognomen; consisting for the most part of minute distinctions, suggested by the text of his author, with arguments on both sides precisely stated, and distinctions

* See Hauréau, vol. ii. p. 10.

† Scotus de Univ. Qu. 3. Smigleci Logica, Disp. ii. Qu. 1.

drawn to the extreme of subtlety. Scotus, like Aquinas, was a Realist, and the more consistent of the two. He held that the universal existed in the individual, not *really*, as his predecessor had taught, but *formally*^c. Hence the rival sects of Thomists and Scotists, the latter of whom ultimately adopted the name of Formalists. Both agreed, however, in opposition to Nominalism.

From the school of Scotus, however, arose the great reviver of Nominalism, William Occam, the Invincible Doctor, the ablest writer in Logic whom the Schools have produced. His doctrine, like that of Abelard, was really Conceptualism^d. The *Summa totius Logicæ* of Occam is the most valuable contribution of the middle ages to the *Logica docens*. If we do not subscribe to the hyperbole of his editor, Mark of Beneventum, who, borrowing from the well-known eulogy of Plato, declares that if the Gods used Logic, it would be the Logic of Occam, we may fairly allow, with M. St. Hilaire, that it is the clearest and most original of the works of that period. Occam, like Petrus Hispanus, departs from the ordinary arrangement of treating consecutively the *Isagoge* of Porphyry and the several books of the *Organon*. He commences with the different divisions of terms, of which his account is much more complete than that of the *Summulæ Logicales*. He then proceeds to the predicables, introduced by a defence of the nominalist view of universals, then to definition, division, and the categories, and concludes the first part with an account of the supposition of terms. The second part treats of propositions, and the third of syllogisms and fallacies.

Between Scotus and Occam comes in order of time the most eccentric genius of the scholastic period, Ray-

^c On this distinction, see Hauréau, vol. ii. p. 335.

^d See Cousin, Abélard, Introduction, p. clv.

mond Lully. He is principally known as the author of the *Ars Magna*, by which he professed to teach a man ignorant even of letters the whole encyclopædia in the course of three months. This work is nominally logical, but has little in common with the Aristotelian Logic, being principally a mechanical contrivance for connecting different philosophical terms with each other*. But in his *Dialectica*, Lully condescends to follow the beaten track, and has composed a clear and concise synopsis of Logic, framed principally on that of Petrus Hispanus†.

The writings of Occam, as well as those of Scotus, contributed especially to raise Logic to the rank of a distinct science, independent of its applied uses‡. But they approached it from opposite sides. The principles of Occam, developed by modern philosophy, would lead us to the Logic of Kant: those of Scotus, almost to the Logic of Hegel. The science of the former would acquire a clear and distinct object in the province of Thought: that of the latter would gradually absorb all else, as coextensive with Being. Occam is the last great name among the Schoolmen: the triumph of Nominalism involved the downfall of the principal applications of the scholastic method. Buridan, his disciple, the reputed author of the sophism called *Asinus Buridani*§, developed the doctrines of Nominalism to a still further extent, but has the character of having pushed to an

* St. Hilaire, *Mémoire*, vol. ii. p. 225.

† An account of Lully's system will be found in Keckermann, *Præcognita*, ii. 2. 89. and in Gassendi *de Origine Logicæ*, c. 8. See also Hallam, *Literature of Europe*, vol. i. p. 310.

‡ Cf. Hauréau, vol. ii. p. 310. 425. 447 sqq. St. Hilaire, vol. ii. p. 226. M. Hauréau appears to regard Scotus as the author of the distinction between the *logica docens* and *utens*; which is not the case. Cf. Aquinas, in iv. *Metaph.* Lect. 4. Indeed, it is substantially contained in the *διαλεκτική χωρὶς πραγμάτων* and *ἐν χρήσει πραγμάτων* of the Greek Interpreters.

§ See Hamilton on Reid, p. 238.

extreme point the subtleties distinctive of the scholastic system. Another philosopher of the same period, Walter Burley, is the author of some commentaries on the Logic of Aristotle, and deserves mention as the first compiler of a history of philosophy. This work is entitled, *de vita et moribus philosophorum*, and forms a biographical history of philosophy from Thales to Seneca¹.

The reaction against the Scholastic Logic began in the fifteenth century. Laurentius Valla, Rodolphus Agricola, and Ludovicus Vives, successively attacked the system in 1440, 1450, and 1531. Their attacks were directed, partly against the Latinity, partly against the matter of the School Logic. The additions proposed by these reformers are chiefly rhetorical innovations from Cicero and Quintilian.

A more formidable assault was made in 1543 by Ramus; who, adopting the dialectical and rhetorical innovations of the earlier reformers, composed a new system of Logic in opposition to the Aristotelian. He complains of the want of a definition of Logic in Aristotle, and treats it himself as the *Art of Dissertation*; its principal parts being *Invention* and *Judgment*. These he investigates at length in his *Dialecticæ Partitiones* and *Institutiones Dialecticæ*, and in his *Dialectique*, the earliest work on the subject in the French language. *Invention* he treats chiefly rhetorically, giving an account of arguments artificial and inartificial, and loci for establishing them. *Argument* in Ramus denotes any term of a question, not, as in Cicero, the middle. Of *Judgment* he admits three degrees, Axiom, (proposition,) Syllogism, and Method. In the earlier editions of his Dialectic he admits the three Aristotelian

¹ Brucker, vol. iii. p. 856. Burley appears to have held a middle course between Nominalism and Realism. See Hauréau, vol. ii. p. 476.

figures, but afterwards rejects the third. Each figure has six moods, two *general* (universal), two *special* (particular), and two *proper* (singular). Method he divides into *Methodus Doctrinæ*, and *Methodus Prudentiæ*. He rejects, as extralogical, the Categories, the Hermeneia, and the Examination of Fallacies. Ramus, as may be seen even from the above cursory notice, introduced many needless alterations in the language of Logic. In his logical innovations, he is partly indebted to Rodolphus Agricola and Joannes Sturm; and, for some of his attacks on the Aristotelians, to Valla and Vives^k.

On the other hand, the Aristotelian Logic, purified of many of its scholastic accessions, was defended and taught by Melanchthon. The earlier editions of his *Erotemata Dialectica* preceded the attacks of Ramus^l; but in 1547 he published a new edition, in the introduction to which he says, "Ego veram, incorruptam, nativam Dialecticem, qualem et ab Aristotele et aliquot ejus non insulsis interpretibus, ut ab Alexandro Aphrodisiensi et Boethio accepimus, prædico. . . . Etsi multi Aristotelicos libros vituperant, et tanquam tabulas dispersas fractæ navis esse dicunt, tamen, si quid ego judicare possum, affirmo eos Dialecticem recte tradere, et ab iis, qui liberali doctrina exculti sunt, intelligi posse." Melanchthon however agrees with Ramus in considering Logic as an Art. "Dialectica," he says, "est ars seu via recte, ordine, et perspicue docendi; quod fit recte definiendo, dividendo, argumenta vera connectendo, et male cohærentia seu falsa retexendo et refutando." Under their united sanction, this became the prevailing doctrine of Logicians. The authority of Melanchthon

^k For a fuller account of Ramus and his system, see Waddington-Kastus, *De Petri Rami Vita, Scriptis, Philosophia*, Paris, 1848.

^l Keckermann *Præcognita*, Tr. ii. c. v.

established the Aristotelian Logic in the Protestant schools of Germany and Holland, and in Britain. At a later period, a conciliation was attempted between this system and that of Ramus. Burgersdyck, in 1626, classes the Logicians of his day in three schools, the Aristotelians, the Ramists, and the mixed school represented by Keckermann, Aristotelian in matter, Ramist in method^m. These were called Philippo-Ramists, or Semi-Ramists; and were rejected by the genuine disciples of Ramus, as Pseudo-Ramists.

It would be impossible to give any thing like a complete history, or even a list, of the host of logical writers of the sixteenth and subsequent centuries. A brief account of most of them, down to his own time, will be found in the *Præcognita* of Keckermann, published in 1603. A cursory account of the modern schools is all that my present limits will allow.

Of the great schools of modern philosophy, down to the time of Kant, it is remarkable, that, though we have no treatise on Logic from the hand of any of the leaders and representatives of the several sects, we find in every case a work of the kind supplied and adapted to their fundamental principles by one or more of their most eminent followers. Bacon, Descartes, and Locke have left no logical writings, and Leibnitz only a few fragments. To call the *Novum Organum*, or the *Discours de la Méthode*, or the *Conduct of the Understanding*, a

^m Of these, Sanderson says, "Invehuntur ipsi palam in Rameos, laudant Peripateticos: sed tamen in Systematibus suis Logicis Ramei magis sunt quam Peripatetici."

ⁿ The *Regulæ ad directionem ingenii*, a posthumous work of Descartes, is sometimes called his Logic. See Hallam, *Literature of Europe*, vol. ii. p. 454; Franck, *Histoire de la Logique*, p. 250. But Descartes in this work expressly rejects the rules and forms of Logic, as useless for the discovery of truth, and mentions in one place (rule 13.) the only point in which his system has any thing in common with the dialecticians. In fact, this work, though fuller, is in principle the same as the *Discours de la Méthode*.

treatise on Logic, is simply to assume for the Aristotelian Logic a purpose never contemplated by Aristotle or his followers, and then to classify under the same head works pursuing this supposed end by totally different means. To entitle any work to be classed as the Logic of this or that school, it is at least necessary that it should, in common with the Aristotelian Logic, adhere to the syllogistic method, whatever modifications or additions it may derive from the particular school of its author. In this point of view, the Baconian school may be represented by the Logics of Hobbes and Gassendi; the Cartesian, by those of Clauberg and Arnauld; that of Locke, by Le Clerc and 'S Gravesande*; that of Leibnitz, by Wolf, Baumgarten, and his editor Meyer.

The Logic of Hobbes was the natural result of the empirical spirit predominant in the method of Bacon. The results, indeed, which Hobbes deduced, would probably in many points have been rejected by his master; but the indirect influence of Bacon is manifest throughout^p. The end of knowledge, according to Hobbes, is power, and the scope of all speculation is the performance of some action, or thing to be done. In this we recognise the spirit of the *Novum Organum*, of the method which its author describes as "ascendendo primo ad

* The sensationalist school of France, professing to be an offshoot of that of Locke, has produced more than one treatise nominally on Logic; the principal ones being those of Condillac and Destutt de Tracy. But these have nothing in common with the Aristotelian system. Condillac regards Logic as an art of thinking, but thought is identified with sensation, and the process of reasoning is nothing but the analysis of our sensations by means of language. Hence his declaration, *tout l'art de raisonner se réduit à l'art de bien parler*. In the system of De Tracy, Logic is the science of the characteristics and causes of truth and error in the combination of our ideas. His work is strictly psychological, examining, on the extreme sensationalist hypothesis, into the formation of ideas and their different modes of combination.

^p See Morell. Hist. of Modern Philosophy, vol. i. p. 86.

axiomata, descendendo ad opera." Reasoning, according to Hobbes, is computation, the adding and subtracting of our thoughts and of their signs. A proposition is but the addition of two names, and a syllogism the adding together of three. In a proposition, two names are so coupled together, that he that speaks conceives both to be names of the same thing; from whence it follows that truth and falsehood consist only in speech, and that the first truths were arbitrarily made by those who first imposed names on things. A full criticism of this doctrine would exceed my present limits. I can only observe that the main error of Hobbes does not lie, as is sometimes said, in his theory of *notions*, but in that of *judgments*. He has overlooked the fact, that apprehension is primarily the analysis of judgment, not judgment the synthesis of apprehensions.

The Baconian influence is also manifest in Gassendi, the friend of Hobbes and the antagonist of Descartes. Like Hobbes, he describes reasoning as a computation, and he anticipates Condillac in tracing all knowledge to sensation. He adopts the fourfold division of Logic, into Apprehension, Judgment, Reasoning, and Method, which had virtually been invented by Ramus and accepted by the Semi-Ramists, and which was shortly afterwards adopted by the Port Royal Logic. He admits two figures only of Syllogism, an affirmative and a negative, (answering to the affirmative and negative moods of the first figure in Aristotle;) and it is worthy of remark, that in the order of the premises, he returns to the arrangement of the Greek Logicians, (the reverse of that of the Latins,) and places the minor before the major. His theory of reduction, by which he brings every syllogism ostensibly to his two figures, contains some curious blunders.

Clauberg, called by Wolf *optimus omnium confessione*

*Cartesii interpres*¹, published his *Logica Vetus et Nova* in 1654. It contains more of Cartesianism even than the Port Royal Logic, and is divided into four parts, *Logica Genetica*, *Logica Analytica*, *Hermeneutica Genetica*, and *Hermeneutica Analytica*. The two last parts are a series of rules for interpreting and criticising the writings of others. The second treats of methods of teaching, and the qualifications for a good teacher and learner. The first, or Logic proper, is interspersed with numerous psychological precepts, chiefly taken from the *Discours de la Méthode* of Descartes. Many of his examples are also taken from the Cartesian philosophy. His rules for induction are fuller than in the old Logic, and those of syllogism shorter.

The Port Royal Logic, or Art of Thinking, is considered as the Logic *par excellence* of the Cartesian school. This work has been attributed to several authors; but is now generally allowed to have been written by Arnauld, assisted by Nicole. The first edition appeared in 1662. In addition to the logical merits of this work², the elegance and simplicity of its style contributed immensely to spread and popularize doctrines which had hitherto been reserved for the study of the learned in the dry formulas of the schools³. The authors, however, must be admitted to have sacrificed in some degree scientific accuracy to popularity; and in their attempt to convey miscellaneous instruction in logical examples, they have unfortunately given their high authority to the support of that spurious utilitarianism which has so often defaced the simplicity of logical science.

¹ *Ontologia*, §. 7.

² For an account of the scientific merits of the Port Royal Logic, see the Introduction to Mr. Baynes's Translation, p. xxix.

³ St. Hilaire, vol. ii. p. 271.

Father Buffier is also entitled to honourable mention among the French Logicians. In his *Principes du Raisonnement*, the rules of the syllogism are reduced to a single principle, *that which is in the contained is in the containing*. This formula, an important step towards the true law of syllogism, the Principle of Identity, is perhaps originally due to Leibnitz[†]. Buffier has had the good fortune to receive high praise from two very opposite quarters, and on very different grounds. He has been celebrated, on the one hand, as one of the earliest who attempted to found philosophy on certain primary truths, given in certain primary sentiments or feelings; and, on the other hand, as having advanced some important steps in the direction of the sensationalism of Condillac[‡].

Le Clerc, (Joannes Clericus,) the friend and disciple of Locke, published his *Logic* in 1692, three years after the first edition of Locke's *Essay*, of which he had previously seen the *Epitome*. This work is principally based on the views of Locke, with some additions from the Port Royal *Logic*, and the *Recherche de la Vérité* of Malebranche. The fourth book, on Argumentation, does not materially differ from the Aristotelian view; though, like Locke, he has not a high opinion of the syllogism, and considers it to be mainly an instrument of disputation. He adds a chapter on the Socratic method of discussion, which he considers more valuable than the Aristotelian syllogism. The *Logic and Metaphysics* of 'S Gravesande, published in 1736, is highly praised by M. St. Hilaire, as simplifying with great clearness the ancient *Logic*, in connection with the principles of Locke. The doctrines of Locke, modified

[†] See St. Hilaire, vol. ii. p. 274.

[‡] See Hamilton on Reid, p. 786. and Destutt-Tracy, *Éléments d'Idéologie*, P. iii. p. 130.

by Cartesianism, had also considerable influence on the Logic of Watts, in which a somewhat incongruous union of Logic, Metaphysics, Psychology, and Educational Precepts is put forth as the Art of using Reason well in our inquiries after truth, and the communication of it to others.

The most important work on Logic from the school of Leibnitz is the *Philosophia Rationalis* of Wolf, first published in 1728. Wolf is regarded by Kant as the representative of the dogmatic philosophy. Philosophy with Wolf is the science of things possible, so far as they are possible, and contains three principal branches, Theology, Psychology, and Physics. The criterion of the possible is the principle of contradiction. Whatever is not contradictory is possible*. Logic directs the mind in the knowledge of all being; its principles being drawn on the one side from Ontology, on the other from Psychology. The *Logica Docens* is defined by Wolf as a Practical Science; the *Logica Utens* as an Art; the former being acquired by teaching, the latter by practice. The details of Wolf's Logic are principally Aristotelian, with one or two ingenious but perverse refinements. Thus, he reduces subaltern opposition to a syllogism with an identical minor premise, and all immediate consequences to abridged hypothetical syllogisms. Induction he regards, like Archbishop Whately, as a syllogism with the major premise suppressed. Wolf is also the author of a smaller Logic in German, of which there is a good English translation, published in 1770.

To the same school as Wolf belong Baumgarten and Meyer. Baumgarten is highly praised by Kant for his concentration of the Wolfian system. An annotated copy

* On this criterion, see Hamilton on Reid, p. 377.

of Meyer's Logic is the foundation of that of Kant himself¹.

Lambert, whose *Neues Organon* appeared in 1764, may be regarded as uniting in a great measure the doctrines of the antagonist schools of Locke and Leibnitz, and as the precursor of the Critique of Kant. His system is divided into four principal parts, contributing conjointly to the investigation and communication of truth: *Dianoiology*, or the doctrine of the laws and powers of the understanding in thought; *Alethiology*, or the doctrine of truth as opposed to error; *Semiotic*, or the doctrine of signs and their influence on the knowledge of truth; and *Phenomenology*, or the doctrine of false appearances and the means of avoiding them. In his first part, he principally follows Wolf, but differs from him in his view of the Syllogistic figures; the three last figures being regarded as resting on independent axioms, coordinate with the *dictum de omni et nullo*. These axioms are distinguished as *dictum de diverso*, *dictum de exemplo*, and *dictum de reciproco*. In his second part, which treats of simple and complex notions, and of truth and error, Lambert acknowledges his obligations to Locke. In the third, the theory of language and its relation to thought is treated with considerable fulness. The fourth part, which treats of appearance as distinguished from reality, has more of a metaphysical and psychological than of a logical character, with some mixture of physiology.

Kant has done more for logical science than any philosopher since Aristotle; partly in his distinct treatise on the subject, and still more in the exact examination of the forms and functions and limits of thought which runs through the Critique of Pure Reason. To Kant is owing, what has been so long needed, a

¹ See the Preface to Rosenkranz's edition of Kant's Logic.

definition of Logic, which secures for it a distinct and positive field of inquiry, as the *Science of the Necessary Laws of Thought*. Kant also did great service in banishing to a separate region, under the name of Applied Logic, the psychological precepts which his predecessors, especially the Cartesians, had incorporated with the body of the science, and giving thereby to formal thought its proper position as the object of Pure Logic. His demonstration that an universal material criterion of truth is not only impossible, but self-contradictory^a, has furnished us with the principle of a more liberal and enlightened appreciation of the real character and value of formal thinking than can be supplied by the whole previous history of philosophy.

At the same time, it must be admitted that the logical system of Kant is chargeable with one serious deficiency, which has been prominently shewn in the subsequent history of the science. He divorces altogether his *a priori* science from all connection with the psychological phenomena of consciousness, from all examination of the actual characteristics of any determinate operation of thought^b. These matters he rejects as empirical; but without such empiricism, Logic and all pure science is impossible. It is matter of each man's personal experience that he actually thinks; and, without examination of the phenomena of special acts of thought, it is impossible to ascertain the necessary laws of thought in general^c. Logic and Psychology thus necessarily form portions of one and the same philosophical course, and, without a knowledge of the latter, it is impossible to have any sound criticism or accurate estimate of the former.

The writings of Kant have had immense influence on

^a *Logik*, Einleitung, vii.

^b See *Kritik der r. V.* p. 58, 276, ed. Rosenkranz.

^c Cf. Cousin, *Leçons sur Kant*, p. 180.

the subsequent Logic of Germany. It is true that the two greatest of his immediate successors, Fichte and Schelling, have produced no direct logical work; and have openly expressed their low estimate of the science^c. But a host of able writers have notwithstanding arisen, as numerous as the Logicians of the sixteenth and seventeenth centuries, to promulgate, to correct, or to oppose the Kantian Logic. Some of these, as Hoffbauer and Kiesewetter, adhere for the most part to the Kantian limits. Others, as Krug and Fries, are mainly Kantian, though they have materially enriched the science from their own resources; and the latter has especially noticed the want of a psychological relation, as the main defect of Kant's system. The most eminent name among the strictly formal Logicians since Kant is Herbart; but both he and his disciple Drobisch have pushed to an extreme Kant's error in an exclusively *à priori* view of the science.

On the other hand, the Logic of Hegel reconstructs from the opposite side the metaphysical fabric which Kant had overthrown. After the Kantian Critique, it was impossible to bring a philosophy of the Absolute within the received compass of human thought: there remained only the attempt to expand thought to the immensity of the object, by a gigantic scheme of Intellectual Pantheism, in which the personal consciousness and its limits should be absorbed in the processes of the one Infinite Mind. Such is the fundamental principle of the Logic of Hegel, a Logic constructed, not in obedience to, but in defiance of, the laws of thought, which are held to be valid only for the finite understanding

^c Fichte, in his "Vorlesungen ueber das Verhältniss der Logik zur Philosophie," altogether repudiates the ordinary Logic to make way for a transcendental system, and complains that this was not sufficiently done by Kant. Schelling in his "Bruno" holds the same view. 'Welche Hoffnung zur Philosophie für den, welcher sie in der Logik sucht? Keine.'

dealing with finite objects; the philosophy of the infinite being based on their abrogation.

It is not easy to give in a short compass an account of Hegel's Logic, which shall be intelligible to an English reader. If we were to describe it as an attempt to develop a Philosophy of Being in general, by reproducing the Divine Thought in the act of Creation, we might support the view by sufficient quotations from the work; but it would convey an erroneous impression to one who did not bear in mind the total suppression of *personality*, divine as well as human, in the Hegelian philosophy. It may perhaps be better characterized as an illegitimate expansion of the fundamental principle of the Cartesian philosophy, modified in some degree by the Kantian. "Cogito, ergo sum" is true within the limits of the personal consciousness. I exist only in so far as I am conscious of my existence; and I am conscious only as being affected in this or that determinate manner. Within these limits Thought and Being are identical, and every modification of the one is a modification of the other. But if the same principle is to be accepted in its Hegelian extent, I must commence by ascending from my personal consciousness to a supposed Universal Thought, identical with Being in general. Here personality disappears altogether; and the problem is, to deduce from the identity of Thought and Being in general, the several identical determinations of the one and the other. Such a process is not thought, but its negation. If the Universe had one consciousness, the system might be possible; for Thought and Being are identical only in and through consciousness. But such universal consciousness could not be *my* consciousness; and thus the Hegelian assumption cannot be grasped by any act of human thought. On the other hand, thought without consciousness is inconceivable; since it implies a ne-

gation of the one essential characteristic under which all thought is presented to the human mind. The logical notion which is not a function of my own personal thought, is a mere empty abstraction, inconceivable by reason; and the system deduced from it is incompatible with those regulative truths that are above reason. Vulgar Rationalism subjects belief to thought; it has been reserved for Transcendental Philosophy to subject it to the annihilation of thought.

Speculative philosophy has had three great periods, each of which has been consummated by a critical system of which Formal Logic has been a constituent portion. The Eleatic and Platonic metaphysics found their consummation in Aristotle; the Scholastic Philosophy in Occam; that of the seventeenth and eighteenth centuries in Kant. But from the Kantian philosophy has arisen another phase of speculation, not less dogmatic in its positions, not less extravagant in its aims, not less unstable in its foundations. A criticism which shall sift thoroughly the pretensions of this philosophy, it remains for the present generation to accomplish.

ARTIS LOGICÆ

RUDIMENTA.



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CAP. I.

De Terminis Simplicibus.

§. 1. MENTIS operationes in universum tres sunt*. 1. *Simplex Apprehensio*. 2. *Judicium*. 3. *Discursus*^b.

* *Mentis operationes tres sunt*. More correctly: the *products* of pure thought are three, the Concept, the Judgment, and the Syllogism. Whether these are to be referred to three distinct operations of mind, is a psychological, not a logical question. At any rate, the three operations must be regarded as a merely logical division, invented as a convenient mode of classifying the products of thought, which are the proper objects of Logic. Cf. Herbart, *Psychologie als Wissenschaft*, Th. ii. §. 119.

^b "Sicut dicit Philosophus in tertio de Anima, duplex est operatio intellectus. Una quidem, quæ dicitur indivisibilium intelligentia, per quam scilicet apprehendit essentiam uniuscujusque rei in se ipsa. Alia est operatio intellectus, scilicet componentis et dividensis. Additur autem et tertia operatio, scilicet ratiocinandi, secundum quod ratio procedit a notis ad inquisitionem ignotorum. Harum autem operationum prima ordinatur ad secundam: quia non potest esse compositio et

1. *Simplex Apprehensio*, est nudus rei conceptus intellectivus^c, similis quodammodo perceptioni sensitivæ^d; sicut enim *Imago* rei est in

divisio, nisi simplicium apprehensorum. Secunda vero ordinatur ad tertiam: quia videlicet oportet quod ex aliquo vero cognito, cui intellectus assentiat, procedatur ad certitudinem accipiendam de aliquibus ignotis. Cum autem Logica dicatur rationalis scientia, necesse est quod ejus consideratio versetur circa ea, quæ pertinent ad tres prædictas operationes rationis." Aquinas in Periherm. Lect. 1. Cf. Opusc. xlviii. Tract. de Syll. cap. 1. The passage alluded to by Aquinas is De An. iii. 6. 1. ἡ μὲν οὖν τῶν ἀδιαίρετων νόησις ἐν τοῖτοις περὶ ἃ οὐκ ἔστι τὸ ψεῦδος ἐν οἷς δὲ τὸ ψεῦδος καὶ τὸ ἀληθές, σύνθεσις τις ἤδη νοημάτων ὥσπερ ἐν ὄντων. Ἀδιαίρετα are either ἀριθμῶ or εἶδει. Metaph. ix. 1. 4. The latter only are νοητά, the former αἰσθητά. Cf. Anal. Post. i. 24. 11.

^c Simple Apprehension, in the only sense in which it can have any connection with Logic, is an operation of *Thought*, and is more properly called *Conception*. It is necessary to distinguish Thought, which is *representative*, and whose immediate object is an *universal notion*, gained by comparison and indifferently applicable to many individuals, from the various intuitive faculties, which are *presentative*, and whose immediate object is an *individual* thing, act, or state of mind, existing without or within ourselves. This distinction is properly psychological, but must be carefully borne in mind in reference to the logical character of Thought. A fuller explanation is given in *Prolegomena Logica*, Chap. I.

^d Among various intuitive faculties, it is necessary to distinguish between *Sensation*, *Perception*, and *Imagination*. The two former are distinguished by Stewart, *Outlines of Moral Philosophy*, §. 15. "*Sensation* expresses merely that change in the state of the mind which is produced by an impression upon an organ of sense; of which change we can conceive the mind to be conscious without any knowledge of external objects. The word *Perception* expresses the knowledge we obtain, by means of our sensations, of the qualities of matter."

oculo, ita *Idea* in animo*: estque *Incomplexa* vel *Complexa*.

Apprehensio simplex Incomplexa, est unius objecti, ut *calami*, vel etiam plurium, confuse; ut *calami*, *manus*, &c. *Complexa*, plurium, sed cum ordine quodam et respectu; ut *calami in manu*^f.

And so M. Royer Collard, Jouffroy's Reid, vol. iii. p. 329. "Il y a dans l'opération du toucher sensation et perception tout ensemble: changement d'état ou modification intérieure, c'est la sensation; connaissance d'un objet extérieur, c'est la perception." This distinction originated with Reid: by earlier writers Perception was used widely, as coextensive with Consciousness in general. See Hamilton's Reid, p. 876. *Imagination* is properly the consciousness of an image in the mind resembling an absent object of intuition. The image, like the object which it represents, is individual. By the earlier writers, logical and psychological, this and other processes of intuition are confounded with those of thought. Thus Gassendi, from whom Aldrich has borrowed, treats *Imagination*, *Simple Apprehension*, *Conception*, *Notion*, and *Intellection*, as identical, and employed in the formation of *images*, *ideas*, *concepts*, or *phantasms* of things.

* *Idea*. In the later and post-Cartesian sense of the word; in which sense, it is defined by Locke, "whatsoever is the object of the understanding, when a man thinks." For the history of this word, see Sir W. Hamilton, *Edinburgh Review*, No. 99. p. 182.

^f *Confuse*. This *confused* apprehension of many objects is in truth only a succession of single apprehensions: thus in the example, we have two apprehensions, first of *calami*, and then of *manus*. Aldrich's distinction between *incomplex* and *complex* Apprehension is inaccurate, and depends merely on an accident of language. In respect of thought, it is indifferent whether we express the same notion in many words, as *an animal with the head of a man and the body of a horse*, or in one word, as *Centaur*. Complex Apprehension should properly

2. *Judicium*, est quo mens non solum percipit duo objecta, sed, quasi pro tribunali sedens, expresse apud se pronuntiat, illa inter se convenire aut dissidere^κ.

Arist. de
Int i. 3.

Est enim *Judicium* aliud *Affirmativum*, quod vocatur etiam *Compositio*^h; aliud *Negativum*, quod et *Divisio*.

Porro, tam particula *Est*, quæ affirmando convenientiam exprimit, quam *Non-Est*, quæ negando Dissidium, appellatur *Copula*; (sicut et Grammatica *Conjunctiones Disjunctivas* habet;) atque hanc sub determinatione cognoscendo differt *Judicium* ab *Apprehensione* complexa.

E. g. Si quis dixerit *Triangulum æquilaterum*

be applied only to the apprehension of the proposition, (the *oratio perfecta*,—Aquinas, Opusc. xlviii. de Int. c. 3.) as distinguished from that of a term or an imperfect sentence.

^κ *Percipit duo objecta*. This expression is only accurate in the earlier and wider sense of *perceives* = *is conscious of*. The elements united in the logical judgment proper are general notions, the objects of Conception. With this explanation, Aldrich's definition is tolerably accurate as regards the logical judgment, formed by the union of two concepts represented each by its separate sign in language. But this must not be confounded with the psychological judgment, which takes place in every act of consciousness. The latter is a conviction of the presence of the object of consciousness, either internally in the mind or externally in space. This judgment does not require the aid of language, and to it Aldrich's definition is not applicable. Cf. Cousin, Cours de Philosophie, leçon 23. Hamilton on Reid, p. 243, 375. Prolegomena Logica, p. 53.

^h *Compositio*—*σύνθεσις*. *Divisio*—*διαίρεσις*. See de Int. i. 3.

esse æquiangulum, possum Apprehensione Simplici incomplexa intelligere quid sibi velint singula Orationis hujus vocabula, complexa vero quid tota sibi velit Oratio¹: Quin et ipsius Naturæ lumine intelligo, Duo quælibet objecta vel inter se convenire, vel non convenire, et proinde altera Copularum esse jungenda: Nondum tamen feci iudicium donec Copulam determinaverim, i. e. apud meipsum statuerim hæc Duo Objecta, *Triangulum æquilaterum*, et *Triangulum æquiangulum*, hac Copula *Est*, non autem altera *Non-Est*, oportere conjungi.

3. *Discursus*², est motus sive progressus mentis

¹ Conception, the Apprehension of Logic, implies considerably more than the mere understanding of the meaning of words or sentences. A word or sentence may be intelligible when the notion signified is inconceivable. Conception consists in an *unity of representation*, i. e. in the power of forming a mental image of the several attributes given in any word or combination of words. It is thus imagination relatively to a concept. Cf. Hamilton on Reid, p. 377. *Prolegomena Logica*, p. 24.

² "Additur tertia operatio quæ est discursus, ab uno composito vel diviso ad aliud: hoc tamen fit per argumentationem. Est autem argumentatio oratio significativa discursus rationis ab uno cognito ad aliud incognitum, vel a magis cognito ad minus cognitum. Sunt autem argumentationis quatuor species, scilicet syllogismus, enthymema, inductio, et exemplum." Aquinas, *Opusc. xlviii. Tract. de Syll. cap. 1.* The definition is too wide, being applicable to the immediate inferences of Opposition and Conversion, as well as to the mediate by Argumentation. In all there is a progress from one judgment to another. *Discursus* is more properly the progress from two connected judgments, to a third resulting

ab uno Judicio ad aliud; quod et Ratiocinium dicitur; et significatur Copula Illativa, qualis est *Ergo*, aut alia similis. v. g. *Qui est extra fortunæ potestatem est beatus. Sapiens est extra fortunæ potestatem. Ergo, Sapiens est beatus.*

Singulis operationibus sui accidunt defectus¹.

from their connection. Cf. Port Royal Logic, Introd. "On appelle *raisonner* l'action de notre esprit, par laquelle il forme un jugement de plusieurs autres."

Of this division of the operations of the mind, Sir W. Hamilton has observed, that "it never was proposed as a *psychological* distribution of the cognitive faculties *in general*: but only as a *logical* distribution of that section of them which we denominate *discursive*, as those alone which are proximately concerned in the process of reasoning." *Reid's Works*, p. 242, 692. Hence Aristotle's division, which is *psychological*, will not exactly correspond. The nearest approach to Simple Apprehension is ἡ τῶν ἀδιαίρετων νοήσις; but νοήσις is variously used, and in its widest sense will embrace all the logical operations, and even φαντασία, which belongs rather to the perceptive soul. See *de Anima*, iii. 3. 8. Judgment will correspond nearly to the ἐπιλήψις of *de An.* iii. 3. 7. (Cf. Trendelenburg *Arist. de Anima*, p. 469.) The latter term however is inapplicable to the cognition of axiomatic truths. Discursus answers to διάνοια and λογισμός, the former term being applied both to the faculty and its operation. But there is much uncertainty in the use of all the above terms. Cf. Biese, vol. i. p. 89, 327. Hamilton's Reid, p. 768.

¹ The service supposed to be performed by Logic in relation to these three defects is more fully and clearly stated by Burgersdyck *Inst. Log.* l. ii. c. 1. "Mens nostra quadruplici defectu laborat, cum occupata est in investiganda rerum cognitione: vel enim non assequitur propositæ rei essentiam, sed circa illius accidentia solum hæret ac sensibiles notas; vel essentiam rei confuse tantum concipit, et

Apprehensioni, *Indistinctio*; Judicio, *Falsitas*; Discursui, *Mendosa Collectio*. Quæ cum Sapientes animadverterent, et opportuna illis remedia excogitassent, præcepta sua in unum compegere; eorumque Scientiam dixere *Logicam*, sive *Artem Rationis*^m.

ratione minime distincta; vel in dubiis non reperit quid statuatur, aut etiam statuit quod falsum est; vel denique non servat ordinem in commentando, qui cum natura rerum consentit. Hisce quatuor malis opponit Logica totidem remedia. Definitio exhibet menti essentiam rerum: divisio efficit cognitionem distinctam: syllogismus tollit animi incertitudinem et errorem circa themata complexa: methodus *ἀναρίαν* sive confusionem." Hence it appears that falsity of judgment simply was not regarded as remediable by Logic, but only falsity in relation to the syllogism, i. e. so far as it depends on the assumed truth or falsity of other judgments. But the above statement requires considerable limitation. Every process of thought is liable to a *formal* defect, as violating its own laws, and to a *material* defect, as inconsistent with experience. Thus a concept may be obscure or indistinct formally, as implying attributes which cannot be thought in conjunction, as when its different parts contradict one another: a judgment may be formally false, for the same reason: and a reasoning may be formally inconsequent, as transgressing the laws of the syllogism. In all these cases the fault may be detected by Logic. On the other hand, a concept may be materially obscure or indistinct, as containing attributes which we have never met with in our own experience: a judgment may be materially false, as being at variance with facts: a reasoning may be materially inconsequent, as not warranted by the laws or analogies of nature. In all these cases, the fault can only be detected and remedied by experience. Cf. *Prolegomena Logica*, p. 238.

^m *Logicam*. "Logica dicta est ἀπὸ τοῦ λόγου. Ἄλογος duplex est Aristoteli, ὁ ἴσως καὶ ὁ ἕξω λόγος, id est, *sermo internus et*

Est igitur *Logica*, Ars instrumentalis dirigens mentem in cognitione rerum^a: ejusque partes tres

externus. Sermonem internum vocat τὸν ἐν τῇ ψυχῇ λόγον, id est, *sermonem qui in anima est*: Plutarchus, Damascenus, aliique appellant λόγον ἐνδιάθετον id est *sermonem intus conceptum*; et externum, λόγον προφορικόν, id est, *sermonem foras prolatum*, sive pronunciatum Λόγος ἐνδιάθετος sive internus, nihil est aliud quam ratio sive cogitatio, hoc est, actio mentis res objectas earumque nomina concipientis. Mens enim non solum res ipsas concipit atque intelligit, sed et idonea vocabula excogitat ad conceptus suos aliis indicandos atque explicandos: atque ita quodammodo in seipsa loquitur. Λόγος προφορικὸς atque externus, est sermonis interni cogitationumque interpret, atque (ut Damascenus loquitur, *lib. 2. de Orth. fid. cap. 21.*) ἄγγελος τοῦ νοήματος, id est, *nuncius cogitationis*. Ab utroque sermone appellata est *Logica*, (utrumque enim regit ac format) sed ab interno, quem nihil aliud esse diximus quam mentis rationem sive cogitationem, præcipue nuncupatur; ab externo sermone, sive ab oratione, tantum secundo. *Logica* enim regit cogitationes animi nostri per se; orationem non per se, (hoc enim *Grammaticæ* convenit) sed eatenus tantum, quatenus rationis nostræ sive cogitationum interpret est." *Burgersdicii Inst. Log. l. i. c. 1.* Cf. *Arist. Anal. Post. I. 10. 6.* Οὐ πρὸς τὸν ἔξω λόγον ἡ ἀπόδειξις, ἀλλὰ πρὸς τὸν ἐν τῇ ψυχῇ, ἐπεὶ οὐδὲ συλλογισμός. Ἄει γὰρ ἔστιν ἐνστήναι πρὸς τὸν ἔξω λόγον, ἀλλὰ πρὸς τὸν ἔσω λόγον οὐκ αἶν.

^a *Est igitur Logica.* This definition is more fully given by Burgersdyck, *Inst. Log. l. i. c. 1.* "*Logica est ars conficiens instrumenta, iisque intellectum dirigens in cognitione rerum. Logica docens dicitur quæ præcepta tradit; utens, quæ præceptis utitur. Officium Logicæ docentis, est tradere præcepta et modum efficiendi instrumenta, quibus mens dirigitur in cognitione rerum, instrumentorumque naturam describere. Instrumenta Logica sunt quatuor, definitio, divisio, syllogismus et methodus. Officium Logicæ utentis, est instrumenta, cum opus est, efficere, iisque mentem dirigere, ne in quærenda rerum cognitione hallucinetur.*" From this it appears that

sunt, pro operationibus mentis quas dirigit. 1. *De Simplici Apprehensione.* 2. *De Judicio.* 3. *De Discursu.*

§. 2. QUONIAM vero, inter docendum et disputandum, neque res aliqua, neque conceptus, cui subjacet, commode in medium afferri potest; necesse est vicaria utriusque signa substituere, quorum usum idoneum docendo, Logica mentem una ad bene operandum instruit.

Hujusmodi signa apud homines recepta, sunt *Voces*: Nam *Vox* est signum rei vel conceptûs°

the *knowledge of things* was regarded by this school as only the remote object of the *Logica utens*, as applied to this or that matter, and hence not to be gained from any logical treatise. Thus the distinction insisted upon by some critics between *in cognitione* and *in cognitionem*, is of no value; both being merely verbal variations in expressing the same view. This definition of Logic as an art arose from the dialectical and rhetorical innovations introduced by the reformers of Logic in the latter part of the fifteenth century, and was adopted universally by Ramus and his followers, as well as by the Peripatetico-Ramists of the school of Keckermann, and afterwards by the Cartesians. Among the earlier philosophers, the Peripatetics considered Logic to be neither art nor science, but an instrument. The Stoics regarded it as a science, in which they were followed by the Schoolmen. Subsequently, in the schools of Wolf and Kant, Logic again obtained the name of Science, though the former regarded it as a practical, the latter, more correctly, as a speculative science. Cf. Zabarella *de Natura Logicæ*, lib. i. Smigleci *Logica*, Disp. II. Qu. V. Sir W. Hamilton, *Edinburgh Review*, No. 115, p. 203.

° Primarily of the conception, secondarily of the thing. Cf. de Int. i. 2. Καὶ ὥστε οὐδὲ γράμματα πᾶσι τὰ αὐτά, οὐδὲ φωναὶ αἱ

De Int. 1.2. ex instituto vicarium^p: et in significando, primo quidem *declarat* conceptum, deinde *supponit* pro re^q. Dico autem *ex instituto*, quia soni inarticu-

αὐταί: ὃν μέντοι ταῦτα σημεῖα πρῶτως ταῦτα πᾶσι παθήματα τῆς ψυχῆς, καὶ ὃν ταῦτα ὁμοιώματα, πράγματα ἤδη ταῦτά. On the distinction between σημεῖον and ὁμοίωμα, see Waitz. vol. i. p. 324.

^p What Aldrich calls simply *Vox*, is called by Aristotle φωνὴ σηματική, and by Boethius and Petrus Hispanus, *Vox significativa ad placitum*. In the latter case, *Vox* is extended to the grammatical word; in the former, it is limited to what may be called the *Vox Logica*. Logic differs from Grammar, in considering language simply as the *interpretation of thought*, (the ἐρμηνεία of Aristotle,) not as in any way expressive of the passions or the will. Logic therefore solely regards words as the signs of an operation of the reason, and hence its simplest words are the noun and the verb, which alone are *per se* signs of conceptions. Syncategorems, being not significative but consignificative, are excluded from Logic, but recognised by Grammar. So Aristotle, in the *De Interpretatione*, treats only of the noun and the verb. In the *Poetics*, ch. 20. he adds the φωναὶ ἄσσημοι, the conjunction and the article. Cf. Harris, *Hermes*, ch. iii. On the distinction between the logical and the grammatical proposition, some good remarks will be found in Du Marsais, *Principes de Grammaire*, p. 321.

^q *Supponit pro re*. The *supposition* (as it was called) of a term being posterior to its *signification*. The doctrine of the supposition of terms, which is not found in Aristotle, is one of the subtleties of the *parva logicalia*, a scholastic addition to the *Organon*, rather grammatical than logical. *Suppositio* was defined to be "Acceptio termini substantivi pro aliquo;" thus the term *homo*, naturally applicable to men of all generations, is, in the proposition *homo currit*, accidentally limited to existing individuals. In this case it was said, in not very classical Latin, "*homo supponit pro præsentibus*." For further information on the various kinds of supposition, the curious reader may examine Sanderson's *Logic*, b. ii. ch. 2.

lati, vocesque quas Natura sponte suggerit, extra artem censentur.

Jam, quæ simplicem Apprehensionem exprimit, *Vox simplex* est; quæ Judicium, *Complexa**; quæ Discursum, *Decomplexa*. Nam argumentum omne resolvitur in tres *Propositiones*, sive sententias, et propositio omnis complectitur voces, non semper numero, sed sensu semper tres; 1. *Subjectum*, sive de quo aliud dicitur. 2. *Prædicatum*, sive id quod dicitur. 3. *Copulam*, quæ utrisque media intercedit*. Nam Subjectum et Prædicatum quoad

* *Vox complexa* (φωνή συμπλεγμένη) in Aristotle signifies a compound word; his example is ἐπακτροκέλης, of which each part has a meaning in composition. *Vox simplex* (ἀπλή) where the parts have no meaning. The later meaning of *vox complexa* properly corresponds to Aristotle's λόγος (Oratio), and is not limited, as by Aldrich, to the *Proposition* (oratio enunciativa). Thus Petrus Hispanus: "Vocum significativarum ad placitum alia complexa, ut oratio, alia incomplexa, ut nomen et verbum. Orationum perfectarum alia indicativa, ut homo currit; alia imperativa, ut Petre fac ignem; alia optativa, ut utinam esset bonus clericus; alia subjunctiva, ut si veneris ad me dabo tibi equum; alia deprecativa, ut miserere mei Deus. Harum autem orationum, sola indicativa oratio dicitur esse propositio." Sum. Log. Tract. 1. Cf. Boeth. de Syll. Cat. p. 582. With regard to the *vox decomplexa*; as λόγος is defined by Aristotle as a species of φωνή, and syllogism as a species of λόγος, the latter may without error be called vox. But the distinction is unnecessary; the syllogism, as far as apprehension is concerned, being only three several propositions. The connexion between them is not a matter of apprehension, but of reasoning.

* The Latin Logicians distinguish between propositions *secundi adjacentis*, in which the copula and predicate form one word, e. g. "Homo currit," and propositions *tertiæ adjacentis*,

sensum semper extrema sunt, et vocantur ideo *Termini Propositionis*.

Atque hinc adeo vulgo dicitur Pars prima Logicæ versari circa *Terminos simplices*, i. e. voces simplices, Apprehensionem simplicem exprimentes¹: secunda circa *Propositionem*, sive Vocem complexam, quæ Judicium exprimit: tertia vero circa *Syllogismum*, sive Vocem decomplexam, qua Argumentatio sive Discursus exprimitur.

De Int. ch.
2. and 3.

§. 3. PRIMA igitur pars Logicæ versatur circa *Terminos Simples*²; i. e. ejusmodi voces, quæ

in which they are separated, e. g. "Homo est animal." The distinction originates with Aristotle, see *De Int.* 10. 3. But Aristotle does not maintain that propositions of the former kind are to be resolved into the latter. On the contrary, the early part of the *De Interpretatione* is adapted exclusively to propositions *secundi adjacentis*; and in order to make it applicable to such propositions as "Homo est animal," we must consider the copula and predicate as equivalent to a single verb³.

¹ In Aldrich's limitation of the terms, *Vox simplex*, *Vox categorematica*, and *terminus simplex*, are synonymous: syncategorems not being voces (logicæ) at all. But in this usage he is not always consistent.

² Aristotle's *Simple terms*, (ἁπλοὶ, εἰς οὐδὲ διαλύεται ἡ πρότασις,) or, as others call them, *categorematic words*, are the *noun* as subject, and the *verb* as predicate, "*homo currit*." The oblique cases of the noun and past or future tenses of the verb are

³ In *De Int.* 1. 4. it seems at first sight as if λευκόν alone was a ῥῆμα. That this is not the case is clear from *Poetics*, 20. 9. τὸ μὲν γὰρ ἄνθρωπος ἢ λευκὸν οὐ σημαίνει τὸ πότε, τὸ δὲ βαδίζει ἢ βεβάδισε προσσημαίνει τὸ μὲν τὸν παρόντα χρόνον τὸ δὲ τὸν παρελθόντα. In fact, λευκόν, by a common Greek Idiom, is equivalent to λευκὸν ἐστι.

solitariae in propositione prædicari vel subijci possunt; et vocantur ideo *Categorematicæ*, ut *homo*, *lapis*². Quædam etiam Vocabula sunt tantum *Syncategoremata*, sive compartes Subjecti aut Prædicati, ut *omnis*, *nullus*; Quædam etiam mixta³, ut *semper*, i. e. omni tempore; *nemo*, i. e. nullus homo; *Currit*, i. e. est currens; quo etiam modo verbum omne Grammaticum resolvi potest.

Verbum igitur *Logicum* (nempe *purum*) præter Copulam nullum est: cætera ex participio et copula coalescunt⁴.

not simple terms, being only *πρώσεις ὀνόματος* or *ῥήματος*. The noun and verb are thus the only two parts of speech recognised by Logic. See Boethius, *Introd. ad Syll.* p. 561. and Petr. *Hisp. Tract. I.* But it would be more accurate to say that Logic analyses language on a different principle, and hence does not recognise the grammatical parts of speech at all. The logical proposition should be of the form *tertii adjacentis*, and its predicate forms a part of the grammatical verb. Cf. *Prolegomena Logica*, p. 274.

² The terms *categorematic* and *syncategorematic* are not Aristotelian, though the distinction is of course implied in his theory of the Proposition. *Κατηγορημα* in Aristotle means a *predicable*, e. g. *de Int.* 11. 4. Cf. Trendelenburg, *Elementa*, §. 3. Waitz, vol. i. p. 267.

³ *Mixta*. This is clearly a cross division. Every mixed word must, of course, be *categorematic* or *syncategorematic*.

⁴ The copula has an apparent resemblance to the grammatical verb, as being the only part of a logical proposition capable of personal inflection. But inflection is one of the accidents, not one of the essentials of a verb, and belongs to particular, not to universal grammar. The essence of a grammatical verb lies in its signification, being a combination of an attribute and an assertion. Cf. Stoddart, *Universal Grammar*, p. 121. Latham, *English Language*, p. 461. The

DeInt.2.1. *Nomen Logicum*, est Terminus simplex sine tempore significativus^a. Nam ex antedictis, *Terminus simplex* idem valet atque Vox articulata et recta, et ex instituto significans: siquidem exclusæ sunt voces inarticulatæ, quasque natura sponte suggerit; voces autem obliquæ sunt Syncategoremata.

Multæ sunt Nominis Divisiones; quorum tres^b sufficiunt hujus loci instituto; sed ob multiplicem earum usum, quinque alias adjungam.

DeInt.7.1. 1. *Nomen singulare*, est quod rem unam et solam significat, ut *Socrates*: *Commune*, quod plura, et eorum singula significare potest, ut *homo*.

[2. *Transcendens*, quod solis omnibusque veris Entibus convenit, ut *ens*, *res*, *aliquid*, *unum*, *verum*, *bonum*^c. *Supertranscendens*, quod omnibus etiam

copula must of course not be confounded with the verb *est*, which predicates existence, as "Homo est." The whole question is ably treated by Pacius on *de Int.* ch. 3. Cf. Biese, *Philosophie des Aristoteles*, vol. i. p. 95.

^a *Nomen*.—Arist. de Int. 2. 1. ὄνομα μὲν οὖν ἐστὶ φωνὴ σημαντική κατὰ συνθήκην ἄνευ χρόνου. *Sine tempore*, as opposed to the verb, the other simple term, τὸ προσσημαῖνον χρόνον. "*Currit*," e. g. in addition to its principal notion of running, signifies as an adjunct the present time, (see Ammonius, Scholia, p. 105. b. 29.) This distinction is lost when we resolve the verb into copula and predicate.

^b *Tres*, i. e. the three employed in his definition of *predicabile*, viz. those into singular and common, univocal and equivocal, first and second intention.

^c These are usually called the six transcendentals, and are regarded as predicable of the several categories *analogously*, not *univocally*.

fictis, ut *imaginabile, cogitabile* : *Non-transcendens*, omne aliud nomen.]

3. *Finitum*, est cui abest particula *non* : *Infi-* DeInt.2.3
nitum^d, cui præfigitur, ut *non homo*, i. e. omnia
præter hominem : unde particula *non*, dicitur *in-*
finitans.

4. *Positivum*^e, est quod significat rem quasi præ-
sentem : *Privativum*, quod dicit absentiam rei a
subjecto capaci : *Negativum*, quod ab incapaci.
Sic *homo* est vox *positiva* ; *videns* dicitur de homine
positive ; *cæcus* de homine *privative* ; *cæcus*, seu
potius *non videns*, de lapide *negative*.

5. *Univocum*^f, est cujus una significatio æque Cat. 1.

^d *Infinitum*. So translated by Boethius. It should be *inde-*
finitum ; see Hamilton on Reid, p. 685. The translation is
censured by Vives, de Caus. Corr. Art. lib. 3.

^e In these divisions there is much clumsiness and self-
repetition. The distinction between positive and privative
nouns is repeated below, under the four *opposita*. *Negative*
nouns have no business here at all, being opposed, not to
positive, but to *affirmative*, and belonging to another kind of
opposition, the *contradictory*. *Relatives* also form another
member of the same fourfold division ; and *Repugnants* include
all the four *opposita*, and other nouns to boot.

^f *Univocum* (*univocatum*)—συνώνυμον : *æquivocum*, (*æquivo-*
catum)—ὁμώνυμον. Ὁμώνυμα λέγεται ὡς ὄνομα μόνον κοινόν, ὃ δὲ
κατὰ τοῦτονομα λόγος τῆς οὐσίας ἕτερος, οἷον ζῷον ὃ τε ἄνθρωπος καὶ τὸ
γεγραμμένον. Συνώνυμα δὲ λέγεται ὡς τό τε ὄνομα κοινόν καὶ ὃ κατὰ
τοῦτονομα λόγος τῆς οὐσίας ὁ αὐτός, οἷον ζῷον ὃ τε ἄνθρωπος καὶ ὁ βούς.
(Cat. ch. 1.) Analogous nouns are but one out of many
species of equivocal, belonging to the *æquivoca consilio*, (ἀπὸ
διανοίας,) of the Greek interpreters ; to which are opposed the
æquivoca casu, (ἀπὸ τύχης.) See Scholia, p. 42, a. 37, 47.
Boethius in Prædicamenta, lib. 1. p. 117. (Cf. Arist. Eth. Nic.

convenit multis, ut *homo*: *Æquivocum*, cujus diversæ, ut *Gallus*: *Analogum*, cujus una inæqualiter ut *pes*. [Vox ipsa dicitur *Univocum Univocans*: res significata *Univocum Univocatum*, et sic de cæteris.]

6. *Absolutum*^s, est cujus tota significatio spectat

i. 4, 12.) The *συνώνυμα* of Aristotle must be distinguished from the modern synonyms, which answer to the *πολύωνυμα* of Speusippus, (Schol. p. 43, a. 31.) and the *multivoca* of Boethius, and are defined by the latter, "quorum plura nomina, una definitio est." *Συνώνυμα* was used in this sense by the Stoics, and the same sense may also be found in Aristotle, Rhet. iii. 2. 7. and perhaps Top. viii. 13. 2.

^s It is not easy to distinguish accurately the two divisions of terms into absolute and connotative, abstract and concrete, respectively. The following attempt is made with some doubt as to its success. In the second chapter of the Categories, Aristotle divides all *ὄντα* into four classes, Universal Substances, Singular Substances, Universal Attributes, and Singular Attributes. Substances of both kinds exist *per se*; attributes can only exist in substances. Hence the scholastic distinction between Subjects of Predication and Subjects of Inhesion. The universal substances are predicable of the singular, as genera and species of individuals. "Socrates is a man." In this case the individual is a subject of *predication*. Attributes are not in their original state predicable of substances. Whiteness exists in snow; but we cannot say, "Snow is whiteness." Here, then, the subject is not one of predication, but of *inhesion*. But, by an act of the mind, an attribute may be so connected with a subject as to become predicable of it as a differentia, property, or accident; e. g. "snow is white." Predicates thus formed from attributes are called *connotative*, being said to signify *primarily* the attribute, and to *connote* or *signify secondarily* the subject of inhesion. Hence a connotative term may be defined, "One which primarily signifies an attribute, secondarily a subject."

rem per se sumptam, [ut *Justitia* : *Connotativum*, quod eandem quasi alteri nexam, ut *Justus*.] *Concretum*, quod rem quasi sua natura liberam, sed jam implicitam subjecto, ut *Justus* : Abstractum, quod rem quasi sua natura nexam, sed jam subjecto exemptam, ut *Justitia*. [Denique, si *Concretum* Cat. 1. 5. sola terminatione diversum sit ab Abstracto, ut *justus a justitia*, hoc *Denominans* dicitur, illud *Denominativum*, Subjectum vero *Denominatum*^h.

Whereas the original universals, whether substances or attributes, as "man," or "whiteness," were called *absolute*. Again, by an act of the mind, the terms signifying substances may be conceived in the form of attributes, so as to be no longer predicable of the individuals; thus "homo" becomes "humanitas." All such terms, not predicable of singular substances, whether primarily attributes, as "whiteness," or secondarily conceived as attributes, as "humanity," are called *abstract* terms; all that are predicable of the individuals, whether primarily, as "homo," or secondarily, as "white," are *concrete*. Hence the two divisions are distinct in principle, though some of the members of each cross. For example: *Homo* is concrete and absolute, *albus* concrete and connotative, *albedo* abstract and absolute; but no abstract term is connotative.

The above account differs considerably from that given by Mr. Mill, Logic, b. i. chap. 2. He inverts the phraseology, describing the attribute instead of the subject as connoted, and extends connotative terms, so as to include all concrete general names. This is in some respects an improvement on the scholastic distinction, but it must not be confounded with it. The materials of the present note are chiefly from Occam, Logic, p. i. chap. 5, 10. It must be admitted, however, that there is some licence in the use of the word connotative.

^h Παράνυμα δὲ λέγεται ὅσα ἀπὸ τινος διαφέροντα τῇ πτώσει τὴν κατὰ τοῖνομα προσήγοράν ἔχει, ὅλον ἀπὸ τῆς γραμματικῆς ὁ γραμματικὸς καὶ

Cat. 8. 27. Denominativis accensentur aliquando *Derivativa* illa, quæ vel solam nominis Analogiam, vel solam rei vim, non utramque retinent, ut *Studiosus studii et virtutis*. Sed ista verius *Conjugata* sunt¹.

Connotativum quoque dicitur de nominibus quorum conceptus se mutuo ingrediuntur, ut *Pater et Filius*: nam et illa opponuntur absolutis; sed vocantur proprio nomine *Relativa*.]

7. *Convenientia*, sunt quæ possunt de eodem simul dici, ut *doctus et pius*: *Repugnantia*, sive *Opposita*, quæ non possunt, ut *album et nigrum*^k.

Cat. 10. 1. [Oppositio¹ *incomplexa*, sive terminorum simpli-

ἀπὸ τῆς ἀνδρείας ὁ ἀνδρεῖος. Cat. i. 5. The word *παρώνυμα* is translated by Boethius *denominativa*. It should have been *denominata*. From the same authority denominatives have been limited by the Schoolmen to concrete adjectives, predicable of a subject possessing the abstract attribute. Cf. Aquinas, Opusc. xlviii. Tract. 2. cap. 1. The limitation is not warranted by Aristotle, and is expressly rejected by his Greek Commentators. See Simplicius, Scholia, p. 43. b. 5. τῶν δὲ παρωνύμων ἂν εἴη, φησὶν ὁ Πορφύριος, καὶ τὰ πατρωνυμικά καὶ τὰ συγκριτικά καὶ τὰ ὑπερθετικά καὶ τὰ ὑποκοριστικά.

¹ *Studiosus* is used in Scholastic Latin as a translation of the Greek *σπουδαῖος* in the two senses of "diligent" and "virtuous." In the former, it is a denominative from *studium*. In the latter, not, as is observed by Aristotle, Cat. 8. 27. The name *conjugata* is more properly applied to derivatives from the same primitive, as *sapiens*, *sapienter*, *sapientia*; the *σύστοιχα* of Aristotle. Cf. Arist. Top. ii. 9, 1. Cic. Top. c. 3.

^k *Repugnantia* should not be considered as synonymous with *opposita*. There are many repugnants which are not included under any of Aristotle's four modes of opposition: e. g. *red* and *blue* are repugnant, but not opposed.

¹ Λέγεται δὲ ἕτερον ἐτέρῳ ἀντικείμενον τετραχῶς, ἢ ὡς τὰ πρὸς τι, ἢ ὡς

cium, est omnino quadruplex: 1. *Relativa*, inter terminos relativos, ut *Patrem et Filium*. 2. *Contraria*, inter *contrarios*, i. e. absolutos se mutuo pellentes ex subjecto alterutrius capaci, ut *album et nigrum*. 3. *Privativa*, inter privativum et positivum, ut *videntem et cæcum*. 4. *Contradictoria*, inter positivum et negativum, intellige finitum et infinitum, ut *hominem et non-hominem*. Hæc est oppositionum maxima, quia nullum admittit medium; neque *Participationis*, quale est fuscum respectu *albi et nigri*; neque *Abnegationis*, quale est lapis inter *videntem et cæcum*. Relativa contra, omnium minima; nam Relata non sunt opposita, nisi ad idem sumantur.]

8. Nomen^m *Primæ intentionis*, est Vox in com-

τὰ ἐναντία, ἢ ὡς στέρησις καὶ ἔξις, ἢ ὡς κατάφασις καὶ ἀπόφασις. Ἀντίκειται δὲ ἕκαστον τῶν τοιούτων ὡς τύπῳ εἰπεῖν ὡς μὲν τὰ πρὸς τι οἶον τὸ διπλάσιον τῷ ἡμίσει, ὡς δὲ τὰ ἐναντία, οἶον τὸ κακὸν τῷ ἀγαθῷ, ὡς δὲ τὰ κατὰ στέρησιν καὶ ἔξιν, οἶον τυφλότης καὶ ὄψις, ὡς δὲ κατάφασις καὶ ἀπόφασις, οἶον κάθηται οὐ κάθηται. Cat. 10. 1. Cf. Metaph. iv. 10. Contraries are the two most opposite qualities of the same class of subjects, e. g. *black* and *white*, as colours of bodies; *virtue* and *vice*, as habits of the soul. Cf. Cat. 11. 5.

^m "Of the *first intention*," says Hobbes, "are the names of things, a *man*, *stone*, &c. of the *second* are the names of names and speeches, as *universal*, *particular*, *genus*, *species*, *sylogism*, and the like." Except that the language is too much adapted to the ultra nominalism of the author, this passage exactly expresses the true distinction. A *first intention* or *notion* is a conception under which the mind regards *things*, whether facts of external or of internal perception. Thus the individual Socrates is regarded by the mind as *man*, *animal*, *body*, *substance*. All these are first intentions. And a mental state may be successively

muni usu posita. *Secundæ*, Vox artis, quam ex communi sermone sumptam Philosophia recudit denuo et moderatur.

regarded as a *smell*, a *sensation*, a *fact of consciousness*. These again are first intentions. A *second intention* or *notion* is a conception under which the mind regards its first intentions as related to each other. Thus the relation of *animal* to *man*, and of *man* to *animal*, is expressed in the second intention *genus* or *species*. First intentions, as conceptions of things, are predicable of the individuals conceived under them. Thus we may say, "Socrates is man, animal, &c." Second intentions are not so predicable: we cannot say, "Socrates is species, genus, &c." Hence when we are told that a predicable is *commune*, *univocum*, *secundæ intentionis*, it is not meant that all universals are *in themselves* second intentions; but that every predicate *viewed in relation to its subject* may be comprehended under one of Porphyry's five classes of predicables; all which are second intentions. So when Genus is said to be predicable of Species, it is not meant that we can predicate the one second intention of the other, so as to say, "Species is Genus;" but that the first intention "animal" is predicable of the first intention "man;" the relation of the one to the other being expressed by the second intentions "genus" and "species." For this reason Logic was said to treat of *second intentions applied to first*. See Aquinas, Opusc. lvi. Scotus, Sup. Univ. Qu. 3. Zabarella, De Natura Logicæ, lib. i. cap. 19.

The distinction between first and second intentions is generally considered as of Arabian origin. Scotus, however, (Sup. Univ. Qu. 3.) attributes it to Boethius, whose extant writings do not confirm the statement. It is found in Averroes, Epitome de Predicamentis ad fin. For scholastic expositions, see Aquinas, Opusc. xlviii. Tract. I. cap. 1. in 1 Sent. Dist. 2. Qu. 1. Art. 3. Scotus, in 1 Sent. Dist. 23. In Univ. Qu. 11. Occam, Logic, P. i. cap. 11. A good account of the formation of second intentions is given by Burgersdyck,

§. 4. *Vox Singularis*, dicitur alio nomine *Individuum*, ejusque significatum *Unum numero*: neque enim singulare est quicquid Unum dici potest; sed multa, quæ sunt invicem similia, eatenus Unum censentur. Vocantur enim uno eodemque nomine; quod ipsa Vocis definitioⁿ non patitur, nisi in illis reipsa sit, vel saltem concipi possit, una aliqua eademque Natura, quæ huic nomini respondeat.

Talem reperit intellectus, dum plura contem-
plando *abstrahit*^o ab eorum differentiis; i. e. spectat

Inst. Log. lib. i. cap. 2. Aldrich's definition, which is extremely vague though not positively erroneous, was probably suggested by Crakanthorpe, who in his *Præmium* calls second intentions *Voces Artis Logicæ*. It is scarcely necessary to add, that the explanation of Abp. Whately is altogether erroneous.

ⁿ *Vocis definitio*. Since *Vox* is "*signum rei vel conceptus*," not *rerum vel conceptuum*.

^o *Abstrahit*. i. e. abstracts its attention from the distinctive features of the objects presented. The terms *abstract* and *abstraction* have been used in various applications; retaining however in all the primary signification of *withdrawing* the attention from one portion of certain phenomena given in combination to fix it on the rest. In this sense Geometrical Magnitudes are called by Aristotle τὰ ἐξ ἀφαιρέσεως, (*An. Post.* I. 18. 1.); because the Geometer considers only the properties of the *figure*, separating them from those of the material in which it is found. (See *An. Post.* I. 5. 6 *Metaph.* x. 3. 7.) On similar grounds is formed the scholastic distinction of *abstract* and *concrete* terms; since in the former the attribute is considered apart from the subject in which it is perceived by the senses: e. g. sight presents to us only *alba*; the mind forms the conception *albedo*. And so Universals are gained by *abstraction*, i. e. by separating the phenomena in which a

in rebus ea tantum quæ conveniunt, neglectis omnibus quibus dissident; adeoque fundamentum omne discriminis, præter numerum, eximit. Quare naturam sic abstractam, cum sit omni singulorum differentiæ superstes, concipi par est, non ut in singulis diversam, sed ut in omnibus eandem; adeoque *Universale* quiddam sive *Ens unum in multis*: ejusque signum idoneum erit, Nomen commune, *Univocum*, *Secundæ intentionis*, uno verbo, *Prædicabile*^p, sive Vox apta prædicari, i. e. Univoce dici de multis.

given group of individuals resemble each other from those in which they differ. For this reason Locke calls all universals *abstract ideas*; a phrase etymologically allowable, but liable to be confounded with the scholastic use of the word *abstract* in a different sense. For this reason it is better to adhere to the term *universals*; which has at the same time the advantage of leaving the Logician, as such, uncommitted to any metaphysical hypothesis as to their nature; since the Realist may interpret *Universal Substances*, the Nominalist, *Universal Names*, the Conceptualist, *Universal Notions*.

Generalization, which some modern writers distinguish from Abstraction, is properly a species of abstraction; viz. the divesting the presentations of consciousness of the conditions of existence in *space* and *time*, which are characteristic of individuals. This is done by the aid of signs, verbal or other, which are at first signs of individual objects, and subsequently of general notions. Other abstractions may exist without generalization; but these are not processes of thought, but of perception, internal or external. Thus, to fix the eye or ear on a particular sight or sound exclusively, is in the widest sense an *abstraction*, but not a *generalization*. The psychological controversies concerning abstraction cannot be discussed here. See *Prolegomena Logica*, p. 25.

^p “ Prædicabile (Græce κατηγορούμενον) et universale, etsi

§. 5. *PRÆDICABILIMUM*¹ *capita*, constitui et definiri possunt ad hunc modum. Quicquid in multis reperiri potest, vel est tota eorum essentia, vel ejus pars, vel cum essentia conjunctum².

reipsa non differant, (omne enim universale prædicari potest, et omne prædicabile debet esse universale,) ratione tamen diversa sunt. Nam universale, quatenus universale est, prædicatur de inferioribus, in quæstione qua quæritur quid sint: at prædicabile, quatenus est prædicabile, prædicatur etiam de coordinatis, idque in quæstione quæ quæritur qualia sint. Itaque, cum quinque sint prædicabilia, tantum duo tamen universalialia sunt, genus et species. Nam differentia, proprium, et accidens, quatenus talia sunt, non sunt universalialia, sed tantum quatenus sunt genera aut species eorum quæ sub illis continentur. Ex. gr. Sensus est proprium animalis; sed non est universale, quatenus ut proprium de animali prædicatur, sed quatenus prædicatur de visu, auditu et cæteris sensibus, ut genus." *Burgersdicii Inst. Log.* l. i. c. x. The addition of *univocum, secundæ intentionis* is superfluous. The latter has been explained in a former note. The former, though a necessary result of the abstraction here described, is not a necessary part of the notion of a predicable. Indeed, other logicians distinguish between *equivocal, univocal, and denominative* predication. See Sanderson, l. i. c. 6.

¹ The five Heads of Predicables are an addition to the Aristotelian Logic, taken from the Isagoge or Introduction to the Categories by Porphyry, written in the third century. Aristotle's doctrine, as far as it can be gathered from the Topics, differs from that of Porphyry in several points; as does the latter from the view adopted by Aldrich.

² *Quicquid in multis, &c.* These definitions are taken from Albertus Magnus, (de Prædicab. Tract. II. cap. 1.) and were generally adopted by the Realists, in the form of introduction to, or commentary on, the Definitions given by Porphyry. The Nominalists, on the other hand, expressly denied that any predicable was of the essence of the individual. See

Quare Universalia vel (quod eodem redit) Prædicabilia sunt quinque, et non plura; videlicet, *Genus, Species, Differentia, Proprium, Accidens*.

Porph.
Isag. 3, 17.

Nam 1. *Genus*, est quod prædicatur de pluribus ut eorum essentia *pars materialis* sive communis; ut *animal*°. 2. *Differentia*, quæ ut essentia *pars*

Occam, Logica, p. i. cap. 20, 21. To discuss the full bearings of this controversy would exceed the limits of a note. It will be sufficient to observe, that a considerable portion of the language adopted by Aldrich is not even intelligible, except on realistic principles; and that whenever the same language is adopted by a Nominalist, he is inevitably involved in inconsistencies and self-contradictions. The same is in some degree true of the original exposition of Porphyry, though the latter professes to leave the question of Nominalism and Realism open. But the question of the existence of universals *a parte rei* is metaphysical, not logical, and no theory on this point ought to influence the language of Logic. The rules of Logic are primarily regulative of *thoughts*; and equally so, whatever opinion we may hold concerning the essence of *things*. For this reason, it is necessary to alter nearly the whole of Aldrich's language, in speaking of the logical predicables. On the realist point of view, see further, Appendix, note A.

* "Genus speciebus *materia* est. Nam sicut æs, accepta forma, transit in statuam, ita genus, accepta differentia, transit in speciem." Boethius *de divisione*. But as logicians, we are not warranted in introducing any portion of the essence of *things*, but only of *concepts* or *general notions*. The whole essence of a concept is the sum of the attributes which it comprehends, and this can only be fully declared by its *definition*, not, as Aldrich says, by *species*. The *Genus* or *material part of two given concepts*, (to speak of the material or formal part of a *single concept* is nonsense,) is the sum of those attributes which are common to both; as the *difference*

formalis sive discretiva; ut *rationale*. 3. *Species*, Isag. 3. 1, 17, 20.
 quæ ut tota essentia; ut *homo*. 4. *Proprium*,
 quod ut essentiaë junctum necessario; ut *risibile*.
 5. *Accidens*, quod ut essentiaë junctum contin-
 genter; ut *album, nigrum, sedere*†.

or *formal part* is composed of those attributes which are peculiar to each. Thus, if there be given three concepts, containing respectively the attributes, *ab, ac, bc*, *a* is the genus of the first compared with the second, *b* and *c* the respective differences. But if the first is compared with the third, *b* becomes the common genus, *a* and *c* the respective differences. In this, the only tenable logical point of view, there can be no such thing as an absolute genus or difference.

† *Necessario—Contingenter*. This distinction is based on the supposition that certain attributes are necessarily connected with others, from which they flow, as effect from cause. Thus *risibility* was described in the scholastic philosophy as necessarily flowing from *rationality*, in the same manner as having the angles at the base equal to each other necessarily results from the equality of two sides in an isosceles triangle. But this theory, originally borrowed from the mathematics, is not true of any succession of physical phenomena. As a matter of fact, we experience that certain events are invariably conjoined, but there is not, as in mathematical demonstrations, any necessity that they must be so. Invariable succession, in fact, is the highest positive notion of causality to which we can attain in the case of sensible phenomena, though this limitation does not include the moral causality of which we are conscious in volition. Necessity, however, in any sense is untenable as a logical criterion of property, since it presupposes an acquaintance with the laws of any given physical phenomena, of which the logician as such knows nothing. A better logical distinction between property and accident is that given by Aristotle, of the *convertible* and *non convertible* attribute. See Appendix, note A.

Patet hinc 1°. De iis *dici Prædicabile* quibus *inest Universale*. Genusque adeo, quod est plurimum essentiarum vel specierum pars communis, de *specie differentibus*, h. e. de diversis speciebus quas ingreditur, dici; ut *animal* de *homine* et *bruto*. Speciem vero, de *numero differentibus*, h. e. de diversis individuís, quorum singula habent essentiam speciei vocabulo significatam; sic *homo* de *Socrate* et *Platone* dicitur, et de omnibus, quibus natura inest humana. Reliqua vero Prædicabilia, (prout inferius patebit) eadem de causa, tam de specie quam numero differentibus dicuntur.

Et N. B. ex recepto more loquendi, Genus et Speciem *prædicari in* (i. e. respondere quæstioni factæ per) *Quid*ⁿ; Differentiam in *Qualequid*; *Prædicatur in Quid*; i. e. is expressed by a noun substantive: *in Quale*; by an adjective. See Aquinas, *Opusc.* xlvi. cap. 2. (Cf. Abelard, *De Gen. et Sp.* p. 528. ed. Cousin.) That the distinctions of substance, quality, and the other categories, are founded on grammatical grounds, is shewn by Trendelenburg, *Excerpta*, §. 3.

The reader of Locke must not confound this distinction with that between *substances* and *modes*; *Essay*, b. ii. ch. 12. (Cf. Descartes, *Princ.* i. 48. Port-Royal Logic, p. 1. ch. 2.) A quality is predicated *in quid* of another quality, as well as a substance of a substance; e. g. "Prudence is a virtue." Cf. Pacius on Top. i. §. 3. Port-Royal Logic, part i. ch. 7.

The distinction between *Qualequid* and *Quale* is not warranted by Porphyry. According to him, Differentia, Proprium, and Accidens are all predicated, ἐν τῷ ὁποίῳ τί ἐστιν. Boethius distinguishes them as *Quale in substantia* and *Quale non in substantia*. The *vulgatæ definitiones* which follow are the original definitions of Porphyry, adopted by most subsequent Logicians.

Proprium et Accidens in *Quale*. Unde facile est conficere vulgatas Prædicabilium definitiones. Nam *Genus* definitur, *Prædicabile quod prædicatur de pluribus specie differentibus in Quid*. *Differentia*, ^{Isag. 2. 8. 2. 21.} *quod de pluribus specie vel numero differentibus in Qualequid &c.*^{*} ^{Isag. 3. 17.}

Patet 2°. *Genus* esse *Totum* quiddam, nempe ^{Arist. Metaph. IV. 2. 3. 2. 3. Isag. 8. 8.} *Logicum*, sive in modo loquendi; quatenus continet (i. e. prædicationis ambitu complectitur) species tanquam *partes* sui *subjectivas*. *Speciem* quoque *Totum* esse, nempe *Metaphysicum*, sive in modo concipiendi; quatenus continet (i. e. ad perfectionem sui postulat) *Genus* tanquam *partem* sui *essentialem*[†]. Unde *Differentia* *Generi* accedens, ^{Isag. 3. 7. 13.}

^{*} *Specie vel numero*, i. e. generic difference *de specie differentibus*; specific, *de numero differentibus*. But this would not be allowed by Porphyry, according to whom differentia is always predicated *de specie differentibus*. The remaining definitions might be supplied as follows; *Species, quod de pluribus numero differentibus in Quid*. *Proprium, quod de pluribus numero differentibus in Quale*. *Accidens, quod de pluribus genere vel specie vel numero differentibus in Quale*. The two last, however, are not given as definitions by Porphyry.

[†] *Totum Logicum—Totum Metaphysicum*. The propriety of this nomenclature may be questioned. “Universale,” says Burgersdyck, “totum quoddam est; quippe multa complectitur ut partes. Dicitur *totum Logicum*, quia Logicæ munus est de universis disputare. *Genus* et *differentia* distinguuntur sola ratione; ideoque compositio ex genere et *differentia* non est vera compositio, sed compositio rationis. Hoc totum solet appellari *totum Metaphysicum*, quia *Metaphysica* versatur circa ea fere, quæ non tam reipsa quam ratione diversa sunt.” *Inst. Log.* l. i. c. 14. But in truth, as regards mere notions,

dicatur *Genus* ipsum *dividere*, quatenus ejus significata distinguit, et *speciem constituere*, quatenus ejus essentiam complet.

Isag. 2. 23, 28. §. 6. *GENUS* aliud *Summum*, aliud *Subalternum*

est: *Species* quoque, in *Subalternam* et *Infimam*

Isag. 2. 23, 29. distinguitur*. *Genus* summum, est quod nulli*,

the potential extension and comprehension are both within the province of Logic; and as regards things, the real essence of a species and the actual subdivisions of a genus are both equally without. The distinction itself is of great importance, and has been expressed in various ways, by the terms *potential* and *actual* whole, whole in *predication* and in *definition*, *universal* and *essential* whole, &c. The best is that adopted by the Port-Royal Logicians, who distinguish the *extension* or subjects of which a notion is predicable from the *comprehension* or attributes which it involves in itself. Thus genus is a whole in extension, species a whole in comprehension. On this important distinction, see the Introduction to Mr. Baynes's Translation of the Port-Royal Logic, p. xxxii. or Mr. Thomson's Outline of the Laws of Thought, p. 128.

* The *Summum Genus* and the *Infima Species*, as here described, are both merely imaginary limits, never arrived at in any process of actual thought. The notion of *Being* or even of *Substance* in general, apart from this or that special combination of attributes, and that of a combination so complex as to admit of no additional attributes in thought, are both psychologically inconceivable. A Highest Genus and a Lowest Species may be admitted in any material science, as the limits at which the investigations of that science begin and end; but such a limitation is made entirely on material grounds, relatively to the purposes of that particular science, and cannot be recognised by Logic. See Appendix, note A.

* The Aristotelian logicians consider the *summa genera* as

Species infima, quæ omni *cognato Generi* subjicitur:
 Genus vel Species subalterna^b, quæ et cognato ^{Isag. 2. 24, 30.}
 Generi subjicitur, et de cognata Specie prædicatur.
 Voco autem *Cognata*, quæ ex iisdem Individuis

ten in number, viz. the ten Categories or Predicaments of Aristotle. These are *οὐσία, ποσόν, ποιόν, πρὸς τι, πού, ποτέ, κείσθαι, ἔχειν, ποιεῖν, πάσχειν*; usually translated, Substance, Quantity, Quality, Relation, Place, Time, Situation, Possession, Action, Passion. The Categories have by different commentators been regarded as a classification of names, of things, and of both; and have been alternately banished to Metaphysics and recalled to Logic. Whatever position they may hold in the Metaphysical writings of Aristotle, in his Logical ones they are expressly declared to be a division of the notions signified by simple terms. *Ens* (τὸ ὄν) was not regarded as a *summum genus* to the several Categories, being considered by Aristotle and his followers as predicable of them, not *univocally*, but *equivocally*, or rather *analogously*. But a classification of Categories is out of place in Formal Logic. From the analysis of any notion, whether given in itself or as forming part of a judgment, I can by mere thinking arrive at the simplest elements it contains; but I cannot by mere thinking determine that all notions so analysed will lead me to exactly ten such elements, neither more nor less. This requires a knowledge, not merely of all the forms of thought, but also of all the characteristics of the objects about which we can think. On the principle of the Aristotelian Categories and the objections raised against them, see Appendix, note B.

^b *Species subalterna*. Here the word *species* has changed its meaning. In the original definition it meant a certain relation in which a predicate may stand to its subject. Man is a Species to Socrates. It now means a certain relation in which a subject may stand to its predicate. Man is a Species to Animal. These are generally distinguished by Logicians as the *species prædicabilis* and the *species subjicibilis*.

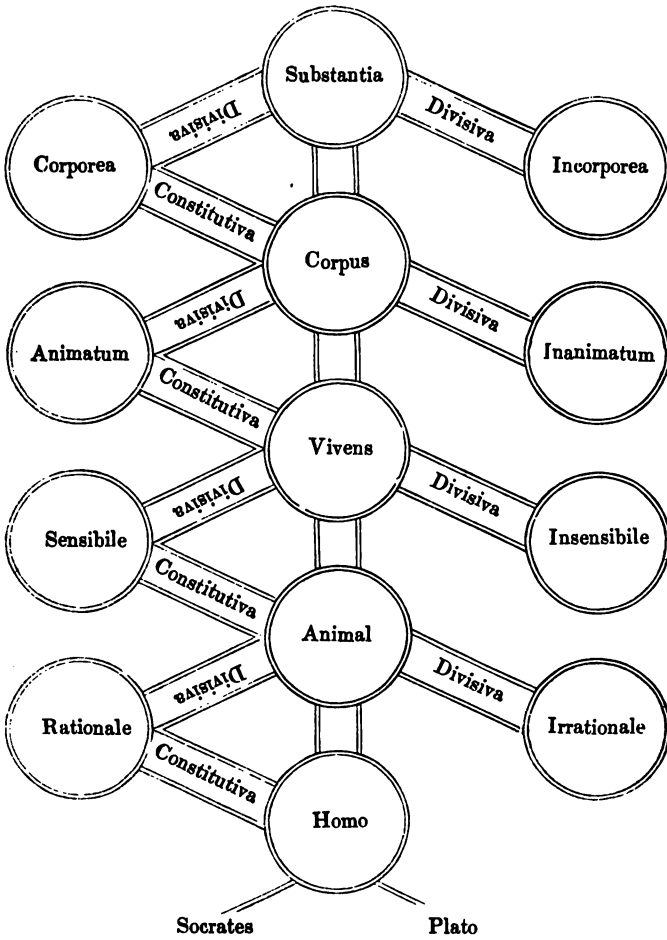
perpetua abstractione colliguntur; ut *Homo*, *Animal*, *Vivens*, *Corpus*, *Substantia*: quæ ex *Socrate*, *Platone* &c. expurgatis continue differentiis oriuntur.

[Hanc seriem ita placuit describi ut quodammodo referret arborem: saltem a Porphyrio sic descripta *Porphyrianæ Arboris*^c nomen habet. Hujus *truncum* referebat *linea directa*, in qua Genera et Species scribebantur: in *suprema* Tabula Genus summum, in *ima* Species infima: unde Nomina. Inter hæc Media Subalterna, suo ordine.

Differentiæ ad latus sunt dispositæ; ad quas ductæ a Generibus suis lineæ *Ramorum* instar pertinebant. Individua sub specie infima oblique descripta sunt, quasi propagines Radicis.]

^c By the Greek Logicians it was sometimes called the *ladder* (κλίμαξ) of Porphyry.

ARBOR PORPHYRIANA^d.



^d This delineation of the Arbor Porphyriana is first given by Aquinas, Opusc. xlviii. Tract. ii. cap. 3. In all the earlier specimens, *Animal Rationale* is placed between *Animal* and *Homo* as the *proximum genus*, and divided into *mortale* and *immortale*, in accordance with Porphyry's definition of Man.

Imag. 3. 0,
14.

Quare 1. *Differentia* est vel *Generica*, quæ constituit Speciem Subalternam; vel *Specifica**, quæ infimam: hæc est, quæ de numero differentibus, illa, quæ de specie differentibus prædicatur. Exempla, *Sensibile* et *Rationale*.

2. *Proprium*[†] quoque, vel *Genericum* est, quod necessario comitatur essentiam Generis summi vel subalterni[‡]; atque ex illa adeo fluere atque oriri

* The term *specific difference* (διαφορά ειδωσιός) has a different meaning in Porphyry. It is opposed to *accidental difference* (διαφορά κατὰ συμβεβηκός,) and marks the *differentia* proper, which distinguishes species from species, (whether subaltern or infima,) as opposed to accidents, which only distinguish between individuals.

† *Proprium*. In formal logic, which cannot take into account the realist theory of essences, it becomes necessary to change slightly the language which expresses the distinction between *proprium* and *differentia*. The essence of a concept is the sum of the attributes which it comprehends. Whatever does not form a part of the *comprehension* of the concept or of the *signification* of its name, is not *part of* but *joined to* the essence: i. e. it is found in all or some of the individuals of the class, but is not implied in the name or notion of the class itself. Thus it is no part of the notion of a triangle that its angles are equal to two right angles; and it is no part of the notion of a body to have weight. These then are *properties*, not *differences*, and, when predicated of their respective subjects, form what Kant calls *synthetical*, as distinguished from *analytical* judgments. Thus the *non-essential* are distinguished from the *essential* predicables. The further distinction of property from accident, as *necessarily* or *contingently* joined, has been already noticed as extralogical.

‡ A *summm genus* can manifestly have no constitutive *differentia*; but it may have properties. There may be attributes forming no portion of the universal nature (or conception) of substance, which are notwithstanding found in all

dicitur: vel *Specificum*, quod fluit ab essentia speciei infimæ: Illud itaque de pluribus speciebus, hoc, de una specie et pluribus Individuis prædicatur. Exempla, *Mobile* et *Risibile*.

Proprium tamen aliunde quadrifariam dicitur^h. Isag. 4. 1.

1. Quod convenit soli, sed non omni; scil. soli Speciei, sed non omni ejus Individuo; ut *homini*

substances and at all times. Such properties of the summum genus are enumerated by Aristotle, Categ. ch. 5. These were in the scholastic theory regarded as flowing from the simple essence; those of all subordinate classes from the differentia.

^h Porphyry, following Aristotle, does not distinguish Property from Accident as flowing necessarily from the essence, but as coextensive and simply convertible with its subject. In this he is followed by Boethius; the other distinction, however, appears as early as in the commentary of Albertus Magnus, and seems to have been derived from the Arabians. (Cf. Albert de Predicab. Tract. vi. cap. 1.) The ἰδιον of Porphyry answers to the fourth kind of property mentioned in the text. The other three are *accidents*; the first and third separable; the second inseparable, but still only an accident, as being predicable of more subjects than *homo*. On the scholastic theory, it is also an accident, as not flowing necessarily from *rationale*, the differentia. Aristotle, who defines man ζῷον πῑρὸν δίπουν, would regard *bipes* as a differentia. It may be observed that, upon the principles of Aristotle and Porphyry, a generic property can only be regarded as a property with respect to the highest species of which it is predicable. As regards all subordinate species, it must be considered as an *accident*. *Mobile*, for example, a property of *corpus*, is an accident to *animal*, and to *homo*, as not convertible with them. This may be fairly inferred from Top. ii. 8, 5. and is also maintained by Avicenna and Albertus Magnus: see Albert. de Predicab. Tract. ix. cap. 1. On the theory of *necessary connexion*, it may remain a property; but on this authorities are divided.

esse Grammaticum. 2. Quod omni, sed non soli ; ut *homini esse bipedem.* 3. Quod omni et soli, sed non semper ; ut *homini canescere.* 4. Quod omni, soli, et semper ; ut *homini risibilitas.* Hujusmodi Proprium est, quod constituit Quartum Prædicabile.

Isag. 14. 7. Isag. 5. 1. *Accidens*, cum essentiae junctum sit contingenter, adesse igitur vel abesse potest, salva interim essentia subjecti ; cui tamen aliquando tam tenaciter inhæret, ut cogitatione sola divelli atque separari possit ; ut *Mantuanum esse, a Virgilio.* Quare vocatur *Inseparabile*ⁱ. Quod autem actu sive reipsa separari potest, ut albedo a pariete, dicitur *Separabile*.

An. Pr. I.
31. 1.
An. Post.
II. 5. 1.
II. 13. 7.

§. 7. QUEMADMODUM VOX SINGULARIS DICITUR *Indi-*

ⁱ We must distinguish between the accidents of a class and those of an individual. Of the former, those are *inseparable*, which, though not connected with the essence by any law of causation, are as a matter of fact found in all the members of the class, and can be the predicates of an *universal* proposition ; e. g. "all crows are black." The *separable* accidents are found in some members of the class and not in others, and therefore can only be predicates of *particular* propositions ; e. g. "some horses are black." This distinction between the separable and inseparable accidents of a class has been transferred by Archbishop Whately to distinguish between difference and property. Of the accidents of the individual, the inseparable can be predicated of their subject at all times ; e. g. "Virgil is a Mantuan ;" the separable only at certain times ; e. g. "Virgil is sitting down." Aldrich's distinction, between *separable in thought* and *separable in fact*, is extralogical. Logic is concerned only with thought, not with physical changes.

viduum, ita et Communis *Dividua* dici potest. Eam enim per Metaphoram dividere dicitur, qui plura ejus significata recenset; nam in uno multa distinguit. Ita qui *animal* dicit *esse* (i. e. vocabulum *animal* *significare*) *hominem* et *brutum*, dicitur *animal in hominem brutumque dividere*.

Quare *Divisio*^{*}, est distincta enumeratio plurium,

^{*} Division was employed by Plato and others as a method of demonstrating definitions. Aristotle shews that the reasoning is unsound, and always involves a *petitio principii*. For this reason he calls it a kind of weak syllogism, though he allows it to be useful for testing definitions when gained: see Appendix, note C. Among the later Peripatetics, Division seems to have been held in higher estimation; a separate treatise on the subject having been composed by Andronicus Rhodius. From them it descended to Boethius, whose book *de Divisione* is the principal authority from which subsequent logicians have drawn.

According to Boethius, the word Division is used in three principal senses. 1. Division of a genus into species. 2. Division of a whole into parts. 3. Division of an equivocal term into its several significations. Of these, according to Cicero, Top. ch. 6. the first is properly called *Divisio*, the second, *Partitio*. "In partitione quasi membra sunt; ut corporis, caput, humeri, manus, latera, crura, pedes, et cetera: in divisione, formæ sunt, quas Græci ideas vocant; nostri, si qui hæc forte tractant, species appellant." Cf. Quintil. v. 10. vii. 1. In Division, the whole or its definition can be predicated of each part, as "Homo est animal," "Homo est vivens sensibile." In Partition this cannot be done. Boethius, however, includes under his second head, not only the enumeration of the component parts of an individual, but also that of the individuals contained under an *infima species*. "Ut cum dico domus aliud esse tectum, aliud paries, aliud fundamentum; cumque hominis dicimus partes esse Catonem, Virgilium, Ciceronem." The last in one respect

quæ communi nomine significantur. Estque analogia distributioni totius in partes. Unde et nomen ipsum Commune dicitur *Totum Divisum*, et distincta ejus significata, *Partes* sive *membra dividentia*, et bene dividendi leges statuuntur tres.

1. ¹Dividentia sigillatim minus contineant (i. e.

more resembles division proper; as the name and definition of the whole are predicable of each part. But on account of the infinite number of individuals, and consequent impossibility of exhausting the species, this is not generally reckoned as a division proper.

The division of an equivocal term, as *canis* into *animal*, *sidus*, *piscis*, is sometimes called *Distinction*. The test of this is, that the name is predicable of each member, but not the same definition. This is useful for separating the senses of an ambiguous term before defining it. See Top. vi. 2. 1.

¹ For the due observance of these rules, it is desirable that the divisions consist of as few members as possible. Some recommend *dichotomy*, or a division of every genus into two species by means of opposed differentiæ. Of the four kinds of Opposition, Boethius admits for this purpose contraries, positive and privative terms, and also contradictories as sometimes unavoidable; but rejects relatives. Aristotle censures the use of privative and indefinite terms, and approves of division by *contraries*. (See Top. vi. 6. 3. de Part. Anim. i. 3.) Here dichotomy is only practicable when the contraries admit no medium between them. Cf. Cat. 10, 18. Top. vi. 6. 1. Examples of dichotomy by contraries may be found in the Arbor Porphyriana. For a threefold division of the same kind, see Eth. Nic. vii. 6, 5. τῶν γὰρ ἡδέων ἓν ἐστὶ φύσει ἀπερὶά, τὰ δ' ἐναντία τούτων, τὰ δὲ μετὰξύ. Dichotomy by *contradiction*, which Aristotle censures, had been a favourite method with Plato, as it afterwards was with Ramus and his followers. See Hamilton's Reid, p. 689. Cf. Trend. Elem. §. 68. Erläuterungen, p. 106.

But none of the above methods of division can be regarded as a strictly formal process of thought. Any concept A is

arctius significant) quam Divisum. Nam Totum ^{Top. VI. 6.} est majus partibus singulis. 2. Dividentia conjunctim plus minusve ne contineant quam Divisum. Nam Totum est æquale partibus universis. 3. Membra Divisionis sint opposita, (i. e. in se invicem ne contineantur :) nam sine distinctione frustra est partitio.

§. 8. DIVISIONEM excipit^m (quæ per Metapho-

potentially divisible into A which is B, and A which is not B; and experience alone can determine whether either of these members includes under it really existing individuals or not. Logically, the division of animal into mortal and immortal is as good as that into rational and irrational. But this division is not strictly formal; for B, the dividing attribute, not being part of the comprehension of A, has to be sought for out of the mere act of thought, after A has been given. This has been observed by Hoffbauer and Fries, who hence rightly maintain, against Kant, that even dichotomy by contradiction is not an act of formal thinking. Cf. Hoffbauer, *Logik*, §. 138. Fries *System der Logik*, §. 92.

The only strictly formal process of this kind is that distinguished as *Determination*, which consists in the reunion of a genus and difference previously elicited by analysis from a given concept. Formal Division thus presupposes Definition. See Drobisch, *Neue Darstellung der Logik*, §. 17, 29, 30.

^m *Excipit*. The reason of this order is given by Abelard: "Quoniam vero divisiones definitionibus naturaliter priores sunt, quippe ex ipsis constitutionis suæ originem ducunt, in ipso quoque tractatu divisiones merito priorem locum obtinebunt, definitiones vero posteriorem." *Dialectica*, ed. Cousin. p. 450. This is true in a material point of view; the matter of a definition being sometimes gained by division. But formally, the reverse order is preferable; a formal division or determination being only possible after definition. See the last note.

ram quoque dicitur) *Definitio*; cujus est, assignare conceptus et voces, quibus ea, quæ ab invicem distincta volumus, velut agrorum fines, ex limitibus suis dignoscantur. Quæ cum definitis notiora esse debeant magisque obvia, *Definitio* vulgo dicitur

Top. I. 5. 1. *Oratio explicativa definiti*. *Oratio* (inquam) ut a nomine distinguatur; *Explicativa* quoque, nam et nomen *exprimit*.

An. Post.
II. 7. 5.

Definitio alia, *Nominalis* est, quæ vocis significationem aperit; alia, *Realis* quæ rei^a naturam.

^a *Rei*, i. e. of an universal notion existing in the mind; without entering on the question whether there exists any external universal nature corresponding to it. Since all such notions are represented by words, a *real*, or more correctly speaking a *notional*, definition, will at the same time unfold the meaning of the word by which the given notion is represented. Still the two kinds of definition must not be confounded. A real definition has primarily for its object to analyse a complex notion into its component parts. Words are employed *secondarily*, though unavoidably, as signs, both of the whole notion, and of the simpler notions of which it is composed. But the object of nominal definition is to determine of what notion, simple or complex, a given word is the sign. The notion may be already known, more or less clearly, by means of other signs, though we were not aware of its connexion with the word in question. A different distinction between nominal and real definition is given by Leibnitz, *Nouveaux Essais*, l. iii. c. 3.

If this account of real definition is correct, it will follow that the same notion admits of only one definition; since the same notion cannot be a combination of more than one group of attributes. And nothing can be more clear than Aristotle's testimony on these points, nothing more positive than his repudiation of the so-called *accidental* and *physical* definitions. (Cf. Top. vi. 4, 2. vi. 14, 5. i. 8. 2, 3. Metaph. vi.

Realis iterum vel *Accidentalis*, sive *Descriptio*, quæ definito accidentia (puta causas, effectus, proprietates aliaque id genus) assignat; vel *Essentialis*, quæ partes essentiae constitutivas. *Essentialis* denique, vel *Metaphysica* sive *Logica*°, quæ Genus

11, 15.) Nevertheless, on the strength of a misunderstood passage in the *De Anima*, (i. 1, 16.) the threefold division of real definition has been fathered on the Stagirite. For a fuller account of Aristotle's doctrine, see Appendix, note C. Before quitting this subject, it may be observed, that logicians have perpetually confounded the *thing* or *notion* within the mind with the *things* or *individuals* without. Thus, Abp. Whately observes, that Logic is concerned with nominal definitions only; because all that is requisite for the purposes of reasoning is, that a word shall not be used in different senses; a real definition of any thing belongs to the science or system which is employed about that thing. On the contrary, Logic is concerned with *real* or *notional* definitions only: its object being to produce *distinctness* in *concepts*, which are the *things* of Logic. Nominal definitions belong to the grammars or dictionaries of particular languages. Even Kant (*Logik*, §. 106.) has not quite avoided this confusion.

° *Metaphysica sive Logica*. On this point the two great sects of the Schoolmen were at issue. The Realists, following the Arabians, divided Logic into two parts; one, which treated of the essence of incomplex notions and things by *definition*; the other, of the truth of propositions as determined by *argumentation*. To this latter the greater part of the Aristotelian Logic was regarded as belonging. The former was supposed to have formed a lost portion of the ancient science. The Nominalists, on the other hand, and more correctly, maintained that to investigate the essences of things belonged to the province of Metaphysics; the Logician, as such, assigning no actual definitions, but borrowing them as mere examples from the science to which they properly belong. As authorities for the two views, compare Albert, de Prædicab. Tract. i. chap. 5, 6. with Occam, Logic, part i. chap. 26.

et Differentiam; vel *Physica*^p, quæ partes Essentiæ physicas, i. e. realiter distinctas: nam Genus et Differentia sola mente distinguuntur.

E. g. Definitur homo *Nominaliter*^q, qui ex humo.

^p Physical definition is rejected by Aristotle, (Metaph. vi. 11.) on the ground that the physical parts are not parts of the species, but of the individuals. Aldrich's expression, "*partes essentiæ physicas*," cannot be tolerated, unless we regard universal notions as not merely real substances, but corporeal. In the example given by Aldrich, the so-called Physical definition may be regarded as merely an indirect mode of expressing the same notion that the Metaphysical definition expresses directly. It is thus merely an accidental variation of language, easily reduced to the direct form, and is so regarded by Albert, de Præd. Tract. i. chap. 6. and by Occam, pt. i. ch. 26. In all other cases it is no definition at all.

^q Most Logicians reckon two principal methods of nominal definition: 1. by a synonymous term, e. g. "*ensis est gladius*:" 2. by Etymology, as in Aldrich's example. The former is in fact *translation*, it being indifferent whether the synonyms belong to the same language or not; the latter will in many cases be no definition at all; a large number of words having quite lost their etymological meaning. Neither of these methods is countenanced by Aristotle; see Appendix, note C. The former may be traced to the Greek Commentators; see Alexander, in Metaph. p. 442. ed. Bonitz. The latter is an innovation borrowed from the Rhetoricians, by whom it was called *Notatio*. See Cicero, Top. ch. 8.

"In Mathematics, and in all strict Sciences," says Abp. Whately, the Nominal and the Real Definition exactly coincide; the *meaning of the word*, and the *nature of the thing*, being exactly the same." This remark is based on Locke; (*Essay*, b. iii. c. 3. §. 18.) but it confounds the *Real Essence* of Locke, i. e. the unknown constitution of each *individual* with the *Logical Essence* or contents of a *general notion*. Cf. Zabarella *De Methodis*, l. i. p. 159.

*Accidentaliter**, Animal bipes implume. *Metaphysice**, Animal rationale. *Physice*, Ens naturale constans corpore organico et anima rationali.

Bonæ Definitionis leges potissimum tres sunt.

1. Definitio sit adæquata definito: alias non ^{Top. VI. 1. 1.} explicat definitum. Quæ enim angustior est, explicat tantum *partem*, cum definitum sit *totum*; quæ laxior, explicat *totum*, cum definitum sit tantum *pars*. 2. Ut *per se* clarior[†] sit et notior ^{Top. VI. 4. 2, 7.}

* Accidental definition is composed of genus and one or more *properties*. Accidents properly so called are expressly rejected as useless in definition by Porphyry, Isag. 3. 15. and by Boethius, Opera, p. 8, though admitted by some subsequent authorities. Hence *animal risibile* would be a better example than Aldrich's *animal bipes implume*. But the majority of Logicians have very properly regarded accidental definition, in any form, as no definition, but merely *description*. It does not analyse the contents of a *notion*, but enumerates marks by which one *individual* may be distinguished from each other. The same notion can have but one *definition*; the same individual may have many *descriptions*. Cf. Albert. l. c. Occam, pt. i. ch. 27. Wytttenbach. *Præcept. Log.* p. iii. c. v. §. 14. Drobisch, §. 104.

* Metaphysical definition, the only proper definition in the strict sense of the term, being by genus and *differentia*, (or more correctly by genus and *differentiæ*; see Top. i. 8, 3. and *supra*, p. 24, note s.) it will follow, that all definable notions must be *species*. Hence *summa genera*, which have no *differentiæ*, and *individuals*, which are distinguished only by accidents, are not definable. See Arist. Metaph. iv. 3, 6. (where for *εἶς* read *ὁ*, supported by two Mss. and by Alexander, Schol. p. 693, a. 8.) vi. 15. 2. The supposed difference on this point between Aristotle and Locke, or rather Descartes, may be reduced to a verbal question. See Appendix, note C.

† *Per se clarior*; i. e. composed of parts greater in extension

definito: alias non explicat omnino. *Dico* tamen *per se*, quia *per accidens* potest minus intelligi

Top. VI. 2. quod notius est sua natura. 3. Ut justo vocum
 4. Top. VI. 2. propriarum^a numero absolvatur: nam ex Meta-
 3. IV. 3. 4. phoris oritur ambiguitas, ex nimia brevitate obscu-
 ritas, ex prolixitate confusio.

than the *definitum*, though less in comprehension; as are the genus and differentia, as compared with the species. For the more universal notions are γνωριμώτερα φύσει, though individuals and lower species are γνωριμώτερα ἡμῖν. See An. Post. i. 2. 5. Top. vi. 4. 7, 9.

^a *Vocum propriarum*; i. e. words in common use, called in the Rhetoric, (iii. 2, 2.) κύρια ὀνόματα, i. e. sanctioned by popular use; "quem penes arbitrium est et jus et norma loquendi." Cf. Poet. 21. 5. λέγω δὲ κύριον μὲν ὃ χρῶνται ἕκαστοι. In the Topics, (vi. 2. 4.) they are called *established* names, (κείμενα ὀνόματα.)

CAP. II.

De Propositione Categorica pura.

§. 1. SECUNDA Pars Logicæ agit de *Propositione** sive *Enuntiatione*; quod est signum secundæ operationis Intellectus, sive Judicium verbis expressum.

Quare, ad Propositionem legitimam requiritur.

1. Quoad vocem, ut sit *Oratio affirmans*^b vel De Int. 5.1. *negans*, quæ est ejus *essentia*.

2. Quoad sensum, ut *verum vel falsum significet*, De Int. 4.3. (id scil. quod res est, vel secus, dicat,) quod essen-

* "Sed cum disseramus de Oratione, cujus variæ species sunt,est una inter has ad propositum potissima, quæ pronuntiabilis appellatur, absolutam sententiam comprehendens, sola ex omnibus veritati aut falsitati obnoxia: quam vocat Sergius *effatum*, Varro *proloquium*, Cicero *enunciatum*, Græci *protasin* tum *axioma*;familiarius tamen dicitur *propositio*." Apuleius de Dogm. Platonis, lib. iii. He has not distinguished between ἀπόφασις and πρότασις,—the former of which is rendered by Boethius *enunciatio*, the latter *propositio*. See Trendelenburg, Elem. §. 2. "Ἀπόφασις quum ad syllogismum instituendum tanquam propositio quæ vocatur præmissa adhibetur, πρότασις dicitur." And so Aquinas, Opusc. xlviii. Tract. de Enunc. cap. 1. "Propositio nam solum dicitur de præmissis ipsius syllogismi, sed enunciatio tam de præmissis quam de conclusione." The distinction, however, is not implied in the definitions of the two by Aristotle, de Int. 5. 5. and Anal. Pr. i. 1. 2.

^b *Oratio affirmans*, κατὰφασις—*negans*, ἀπόφασις. These are literally rendered by Apuleius, *Propositio dedicativa* and *abdicativa*.

tiæ necessario nexum, et proinde *proprietas* est. Unde et

3. Non est ambigua; sic enim orationes esset. Nec 4. Solœca vel mutila; sic enim nihil significaret.

De Int. 5.5. . Quare, ea demum Propositio legitima censebitur, Anal. Pr. I. 1. 2. quæ, juxta definitionem vulgatam, est *Oratio Indicativa*^c, *congrua et perfecta, verum vel falsum significans, sine ambiguitate.*

§. 2. Ejus Divisiones variæ sunt;

1. *Categorica*^d est, quæ enuntiat absolute; ut, *Homo est risibilis. Hypothesica*, quæ sub conditione; ut, *si homo est rationalis est risibilis. Vel dies est vel nox.*

Quod *Categorica* dicit, nihilo nexum est; quasi per se subsistens: quod *Hypothesica*, conditioni substat. Unde et hæc Divisio peti dicitur a *Substantia* Propositionis; et per ejus membra respondetur interroganti, *Quæ est Propositio?*

Categorica rursus dividitur in *Puram* et *Modalem*^e. *Hypothesica* in *Conditionalem*, *Disjunctivam*,

^c The proposition is defined by Aristotle, λόγος ἀποφαντικός, which is translated by Petrus Hispanus, *Oratio indicativa*, and better by Boethius, *Oratio enunciativa*. The rest of Aldrich's definition is superfluous.

^d *Categorica*. In Aristotle κατηγορικὸς always signifies *affirmative*, and is opposed, not to ὑποθετικός, but to στερητικός. The latter sense probably originated with Theophrastus, who first expounded the hypothetical syllogism. See Sir W. Hamilton, Ed. Rev. No. 115. p. 221.

^e Aristotle, in de Int. ch. 12. 1. enumerates four modes;

&c. Categorica pura, sive *Propositio de inesse*¹, Anal. Pr.
est quæ pure affirmat vel negat; i. e. simpliciter De Int. 12.

the *necessary*, the *impossible*, the *contingent*, and the *possible*. (*ἀναγκαῖον—ἀδύνατον—ἐνδεχόμενον—δυνατόν*.) These he afterwards, Anal. Pr. i. 2. 1. reduces to two, the necessary and the contingent. See St. Hilaire's Translation, Preface, p. 66. That he adds the true and the false is questionable; the words *ἀληθές, οὐκ ἀληθές*, in de Int. 12. 10. are perhaps only intended to mark the previous four pairs as contradictories, of which the one must be true the other false. Subsequent Logicians, following the Greek Commentators, have multiplied the number of modes *ad infinitum*. Any adverb annexed to the predicate, "*homo currit velociter*," or even an adjective qualifying the subject, "*homo albus currit*," was regarded as forming a modal. The name *τρόπος*, as applied both to the modes of propositions and to those of syllogisms, is not Aristotelian, but comes from the Greek Commentators. (Ammonius, Schol. p. 130. a. 16.)

The post-Aristotelian modes affect the subject or the predicate alone, not the relation between them. They are thus only pure propositions with complex terms, as is remarked by Melanchthon, *Erotemata Dialectica*, p. 132. Aristotle's modes affect the copula and the manner of thinking, and are psychologically distinct *forms* of the proposition, as they are rightly treated by Kant, *Kritik der r. V.* p. 71. But in a logical point of view, the distinction of modals is unimportant, as not influencing any further process of pure thinking. For this reason they are out of place in the logical writings of Kant and his followers. See further, *Prolegomena Logica*, note G.

¹ *De inesse*,—*τοῦ ὑπάρχειν*. We find two expressions in Aristotle, both of which are sometimes rendered by "*being in*." 1. *ὑπάρχειν*, by which the *predicate* is said to be in the *subject*. This is equivalent to *κατηγορεῖσθαι τὸ A ὑπάρχει παντὶ τῷ B = τὸ A κατηγορεῖται κατὰ παντὸς τοῦ B = All B is A*. 2. *εἶναι ἐν*, by which the *subject* is said to be in the *predicate*. *A εἰσιν ἐν ὅλῳ τῷ B = All A is B*. This is exactly the reverse of *κατηγορεῖται*.

dicit Prædicatum inesse, vel non inesse, subjecto ; ut, *Homo est animal. Homo non est lapis.* Modalis, quæ cum *Modo*, h. e. vocabulo experiente quomodo Prædicatum insit subjecto ; ut, *Necesse est hominem esse animal. Impossibile est hominem esse lapidem.* De Categorica pura, et quidem sola, impræsentiarum loquor ; de cæteris alibi dicturus.

De Int. 6. 1. 2. *Affirmativa*^s, est cujus Copula affirmativa est ; ut, *Homo est animal. Non progredi est regredi. Negativa*, cujus negat ; ut, *Homo non est lapis. Nullus avarus est dives. Vera*, quæ quod res est dicit ; ut, *Homo est animal. Falsa*^h, quæ secus ; ut,

The memorable question at issue between Reid and Gillies, (see Hamilton on Reid, p. 684.) turns on this distinction. The former uses "being in" as a translation of *ὑπάρχειν*, the latter, of *ἐν ὧν εἶναι*.

^s *Κατάφασις ἐστὶν ἀπόφανσις τινος κατὰ τινος. Ἀπόφασις ἐστὶν ἀπόφανσις τινος ἀπὸ τινος.* Aristotle de Int. 6. 1. "Affirmatio est enunciatio alicujus de aliquo. Negatio est enunciatio alicujus ab aliquo." Boethius, de Int. p. 332. Aldrich's definition is directly applicable only to propositions *tertii adjacentis*.

^h *Vera—Falsa.* This is material, not logical truth and falsehood, and admits of no criterion from Logic nor from any single science, but only from the proper experience of each separate case. But even in this relation Aldrich's definition is not quite accurate. Material truth does not consist in the conformity of thought with the nature of things *per se* ; for things are known to *us* only in their relation to some one or other of our faculties. Material Truth consists rather in the conformity of the object as represented in thought with the object as presented to the senses or to some other intuitive faculty. Formal or Logical Truth consists in the conformity of thought to its own laws ; and of this, Logic furnishes an adequate criterion.

Homo est lapis. Et cum per hasce species bene respondeatur interroganti, *Qualis est Propositio?* (respondent enim per Differentiam et Proprium quæ in quale prædicantur) dicuntur hæ duæ divisiones peti a *Qualitate* Propositionis. Prior a *Qualitate Vocis*, sive *Essentiali*; Posterior a *Qualitate Rei*, sive *Accidentaria*.

3. *Universalis*¹, est quæ subijcit terminum communem (cum signo universali, *omnis, nullus, &c.* adeoque) pro universis suis significatis distributive sumptum. *Particularis*, quæ terminum communem (cum signo particulari *aliquis, quidam, &c.* adeoque) ex parte tantum significantem. *Singularis*, quæ vocem (vel sponte, vel ex signo saltem) Individuam²; ut, *Socrates legit. Hic*

¹ *Universal*, καθόλου. *Particular*, ἐν μέρει, or, κατὰ μέρος. *Indefinite*, ἀδιόριστος, An. Pr. i. 1. 2. *Singular*, καθ' ἑκάστων, (De Int. 7. 1.) *Omnis* is the sign of an universal proposition only when taken distributively, as, *Omnis homo est animal*; when taken collectively, as, *Omnes Apostoli sunt duodecim*, the proposition is singular.

² Individual names are distinguished as *individua signata*, expressed by a proper name, as *Socrates*; *individua demonstrativa*, by a demonstrative pronoun, *hic homo*; *individua vaga*, by an indefinite pronoun, *aliquis homo, quidam homo*: a distinction found in the Greek commentators, Schol. p. 148, b. 28. Cf. Albert, de Prædicab. Tract. 4. cap. 7. Aquinas, Opusc. xlviii. de Int. cap. 7. Of these, the two first will clearly form singular propositions. With regard to the last, it has been doubted whether they properly form singulars or particulars. Vives maintains them to be singulars; observing, that *quidam* is not more indefinite than *Socrates* to one who is not acquainted with the man. But there is this difference. If we say, "*quidam concionatur*," "*quidam legit*," there is no

*homo est doctus. Indefinita*¹, quæ (terminum communem sine signo, et proinde) ancipitem : nam manente formula, vim recipit diversam ; ut, *Homo est animal*, nempe *omnis* : *Homo est doctus, aliquis* scilicet.

Petitur hæc Divisio a *Quantitate* Propositionis : nempe numero eorum pro quibus subjectum supponit : unde et per has species bene respondetur interroganti, *Quanta sit Propositio ?* Hanc doctrinam Scholastici hujusmodi carmine sunt complexa ;

Quæ ? Ca. vel Hyp. Qualis ? Ne. vel Aff.
Quanta ? Uni. Par. In. Sing.^m

evidence that the same person is spoken of in the two propositions ; while *Socrates*, except by a mere quibble, will always designate the same person. There may indeed be two persons of the same name ; but in this case the name fails to accomplish the intended distinction, and we must specify Socrates the son of Sophroniscus. Hence *aliquis* and *quidam* are properly called particulars. Cf. Wallis, *Logic*, lib. 2. cap. 4.

¹ "The term *indefinite* ought to be discarded in this relation, and replaced by *indesignate*." Hamilton on Reid, p. 692. This proposition has no claim to a place in *Logic*, being only the negation of any logical quantity at all.

^m This, and the greater part of the scholastic memorial verses, are found for the first time in the *Summule Logicales* of Petrus Hispanus, afterwards Pope John XXI. who died in 1277. He does not, however, profess to be the author of them ; indeed some, including the present, are also noticed by his contemporary Aquinas, as established mnemonics. In slight measure he has been anticipated by the Greeks. A mnemonic for the opposition of modals is found in the synopsis attributed to Psellus, and one for the syllogistic moods in Nicephorus Blemmidas. But the genuineness of that portion

§. 3. PROPOSITIO Singularis in Syllogismo æque potest Universali^a. Nam Subjectum ejus supponit pro omni suo significato. *Socrates est homo*, Universalis est, quia omnis ille Socrates tantum unus est. Indefinitæ quantitas judicatur ex materia Propositionis, sive habitudine connexionis extremorum, quæ triplex est; 1. *Necessaria*°, quando

of the works of Aquinas has been questioned, and the treatise which goes under the name of Psellus is probably a translation of the *Summulæ* of Hispanus. The latter work is thus our earliest undoubted authority for these curious specimens of scholastic ingenuity.

▪ This is argued at some length in a thesis appended to Wallis's *Logic*; and is, to say the least, by far the most convenient way of bringing singular propositions under the existing rules of the syllogism. At the same time it may be remarked that the employment of singular terms as predicates is unnatural, and the reasoning, at least in affirmative syllogisms, worthless. See *An. Pr.* i. 27. 3. Indeed it may be questioned whether the *ἐκθεσις* of Aristotle (see below, p. 59.) was regarded by him as a syllogism at all. Cf. Aquinas, *Opusc.* xlvii. Zabarella, *de Quart. Fig.* cap. 7. Some additional remarks will be found in the Appendix, note E.

• Aristotle does not recognise this account of matter as *understood* in every *pure* proposition, but only as *expressed* in a *modal*. (See above, p. 44.) In the latter case it is no test of quantity, as there are universal and particular propositions of each mode. The distinction in the text, however, seems to have been early introduced. It is implied in the commentary of Ammonius on *de Int.* 7. (*Scholia*, p. 115. a. 14.) And Petrus Hispanus defines the three kinds of matter thus: *Necessary*, when the predicate is of the essence, or a property; *contingent*, when it is an accident to the subject; *impossible*, when a repugnant quality. In this point of view, the supposed criterion of quantity is inapplicable to propositions in

extrema essentialiter conveniunt; 2. *Contingens*, quando accidentaliter tantum; 3. *Impossibilis*, quando essentialiter differunt. Unde Propositio Indefinita pro Universali habetur, in materia impossibili et necessaria; pro Particulari vero, in contingenti.

Quare, Quantitas Propositionis, quatenus ad Syllogismum facit, est duplex: *Universalis* et *Particularis*. Et nota, quod Universalis affirmans symbolum habet A; negans E: Particularis affirmans symbolum I; negans O.

Asserit A; negat E: Universaliter ambæ.

Asserit I; negat O: sed Particulariter ambo^p.

In Universali, signum affirmans distribuit tantum

which the predicate is an inseparable accident. But the whole question of matter is clearly extra-logical. See Sir W. Hamilton, Ed. Rev. No. 115. p. 217. The *Logician* cannot determine a proposition to be necessary or contingent, unless stated as such. The point must be ascertained from the Science to which the proposition materially belongs. The Logician, however, may use indefinites as particulars, not assigning a quantity from the matter, but admitting an indefinite premise (and therefore conclusion) where the rules of the figure do not require an universal. Hence the minor premise in fig. 1. may be indefinite, but not the major. See An. Pr. i. 4. 9.

^p On these lines Wallis remarks, "Non tam erant solliciti de syllabarum quantitate, aut syntaxeos ratione, quam ut Rhythmus constet aut ὁμοιοῦλεντον. Alii tamen, quo constet versus, pro *sed universaliter*, substituunt *verum generaliter*; et, quo Syntaxi prospiciatur, pro *ambo*, neglecto Rhythmo, substituunt *ambæ*; respicientes vocem subintellectam, *propositiones*."

Subjectum^a: Negans, etiam Prædicatum. Nam ut verum sit *Omne a est b*, sufficit aliquod *b* convenire omni *a*: sed falsum est *nullum a esse b*, si vel aliquod *b* conveniat alicui *a*. Eodem argumento, ut sit verum *Aliquod a est b*, sufficit si vel aliquod *b* conveniat alicui *a*: sed falsum est quod *aliquod a non est b*, nisi illud *a* differat a quovis *b*.^r Et proinde

In particulari, nullus terminus distribuitur, præter negantis prædicatum, quod semper distribuitur.

Quanquam igitur fieri potest, ut prædicatum distribuatur in affirmante, tamen non est necessarium; sed *per accidens* fit, et *virtute significati*, non *virtute signi*. In statuendis autem Propositionum legibus, spectandum est id tantum, quod structura postulat, non quidquid sensus admittit: cum illud essenziale, et perpetuum sit; hoc mutabile, et incertum.

^a In opposition to this, the almost unanimous doctrine of former logicians, the New Analytic of Sir William Hamilton is founded on the principle that both terms in every proposition have a determinate quantity always understood in thought, and which ought to be expressed in words. Of the truth and value of this addition to the ordinary logical forms there can be no question; but its systematic introduction into the present work would not be possible without a complete rewriting of Aldrich's text.

^r Aldrich assumes the distribution of the predicate in a negative, to prove the simple conversion of E. Those who adopt Aristotle's proof of the latter, (see below, p. 59.) might deduce the former from it. Both however may fairly be allowed to stand on their own evidence.

Hæc igitur regula generalis esto, quod in Propositione A, subjectum tantum distribuitur; in O, tantum Prædicatum; in I, neutrum; in E, utrumque.

§. 4. PROPOSITIONIBUS* accidunt *Oppositio* et *Conversio*. *Opponi* dicuntur duæ, quæ, cum subiecta habeant et prædicata omnino eadem, Quantitate tamen, vel Qualitate vocis, vel utraque pugnant.

De Int. 7. Oppositionis^t doctrina tota colligitur et demon-
Anal. Pr. stratur ex apposito Schemate, in quo, A. E. I. O.
II. 15.

* *Opposed Propositions*,—ἀντικειμεναί προτάσεις, Arist. a term sometimes limited to Contradictories.

^t As Logic can take no cognisance of *understood* matter, the “necessary impossible and contingent” should be omitted from the table of Opposition. It is no part of the province of the Logician to determine *when* a given Proposition is materially true or false; but only what formal inferences may be made upon the assumption of its truth or falsehood. Hence the Canons of opposition should be expressed only in the hypothetical form. They may be briefly given thus:—

1. If A is true; O is false, E false, and I true.
2. If A is false; O is true; E and I unknown.
3. If E is true; I is false, A false, and O true.
4. If E is false; I is true; A and O unknown.
5. If I is true; E is false; A and O unknown.
6. If I is false; E is true, O true, and A false.
7. If O is true; A is false; E and I unknown.
8. If O is true; A is true, I true, and E false.

So that from the *truth* of an universal, or the *falsehood* of a particular, we may infer the accidental quality of all the opposed Propositions; but from the *falsehood* of an universal, or *truth* of a particular, we only know the quality of the Contradictory.

sunt quatuor Propositiones quantitate sua et qualitate signatæ; quæ

sunt *v. f.* (hoc est, *veræ* vel *falsæ*) pro materia *n. i. c.*

(hoc est, *necessaria*, *impossibili contingente*;) quod ex ipsa materiæ definitione satis patet.

De *necessaria*; quia Propositionis extrema in ea essentialiter conveniunt: de *impossibili*; quia

in ea essentialiter differunt: de *contingenti*; quia secus non esset materia contingens. Inspecto igitur hoc Schemate facile est

1. Oppositionis^t *species* numerare; quæ sunt

n. v.			f. n.
i. f.	A. Contrariæ	E.	v. i.
c. f.			f. c.
Subalternæ	Contradictoriæ	Contrariæ	Subalternæ
n. v.			f. n.
i. f.	I. Subcontrariæ	O.	v. i.
c. v.			v. c.

^t *Contradictory*, ἀντιφατικῶς (ἀντικείμεναι). *Contrary*, ἐναντίως. Arist. The term *Subcontrary* (ὑπεναντίως) is not used by Aristotle to denote the opposition of particulars; though he admits the opposition itself, *de Int.* ch. 7. In *Anal. Prior.* ii. 15. he calls it an opposition κατὰ τὴν λέξιν, but not κατ' ἀλήθειαν. The term is used by the Greek commentators, (Ammonius, *Schol.* p. 115. a. 15.) followed by Boethius, *Int. ad Syll.* p. 564. Subaltern propositions (ὑπάλληλοι) are not noticed at all by Aristotle. The laws of subaltern opposition are first given by Apuleius, *De Dogmate Platonis*, lib. 3. though he does not give it a name. He is followed by Marcianus Capella. The name is given by Boethius, *Intr. ad Syll.* p. 566. and in the Commentary on the *De Interpretatione*. The treatise of Apuleius,

vulgo quatuor: *Contradictoria, Contraria, Subcontraria, Subalterna*.

2. Singularum definitiones conficere. V. g. *Oppositio Contradictoria, est inter* (A. O. vel E. I. hoc est) *duas Categoricalas quantitate pariter et qualitate pugnantes. Contraria, inter* (A. E. h. e.) *duas universales qualitate pugnantes &c.*

3. Oppositarum Canones quatuor eruere et demonstrare hunc in modum.

1. Contradictoriæ A. O. vel E. I. sunt in nulla materia simul veræ; in nulla simul falsæ; sed in quacunque una vera, falsa altera.

Soph.
Elench.
b. b.

Sed notandum est, ad Contradictionem requiri quatuor: nempe loqui de eodem 1. *eodem modo*.

2. *secundum idem*. 3. *ad idem*. 4. *in eodem tempore*; quarum conditionum si defuerit aliqua, possunt *Est* et *Non est* inter se bene convenire. E. g.

1. *Cadaver hominis est et non est homo: Est enim homo mortuus; Non est homo vivus.* 2. *Zoilus^a est et non est niger: Est enim crine ruber, niger ore.* 3. *Socrates^x est et non est comatus: nempe*

if genuine, is a production of the second century, contemporary with, or a little prior to, the works of Alexander of Aphrodisias. The three first kinds of opposition are called by him *Alterutræ*, *Incongruæ*, and *Suppares*.

^a *Zoilus*, see Martial, lib. xii. ep. 54.

Crine ruber, niger ore, brevis pede, lumine læsus,

Rem magnam præstas, Zoile, si bonus es.

^x Aldrich has not before mentioned the opposition of *singulars*. "Socrates is wise," "Socrates is not wise." These are contradictories; though the definition does not strictly

est, ad Scipionem, *non est*, ad Xenophontem comparatus. 4. Nestor *est* et *non est* senex: *Est* enim, si de tertia ejus ætate, *non est*, si de prima loqueris.

2. Contrariæ A. E. in nulla simul veræ; in Contingenti, simul falsæ; in ceteris, una vera, falsa altera; nempe in Necessaria, vera A. falsa E; in Impossibili, vera E. falsa A.

3. Subcontrariæ I. O. in Contingenti, simul veræ; in nulla simul falsæ; in Necessaria, vera I. falsa O; in Impossibili, vera O. falsa I.

4. Subalternæ A. I. vel E. O. et simul veræ, et simul falsæ, et una vera, falsa altera esse possunt. Nam in Necessaria, simul veræ sunt A. I; in Impossibili, simul veræ E. O; in eadem, simul falsæ, A. I. et in Necessaria, simul falsæ E. O; in Contingenti, (propter A. E. falsas, I. O. veras) A. I. vel E. O. sunt una vera, falsa altera.

Possunt etiam aliter hi Canones Oppositarum, cum pluribus aliis, tum hoc quoque modo demonstrari.

1. Contradictoriæ A. O. vel E. I. nec *simul veræ* nec *simul falsæ* esse possunt. Quod enim una

include them, having inadvertently been worded solely with reference to universals. But they have the essential feature of contradictories, that one is always true, and the other false; (de Int. 7, 8.) and the definition given, Anal. Post. i. 2. 6. will include them:—*Ἀντίφασις δὲ ἀντίθεσις ἥς οὐκ ἔστι μεταξὺ καθ' αὐτήν*. Some Logicians call the opposition of singulars, *secondary contradiction*. Boethius, p. 613, regards them as contradictories. See also Wallis, lib. ii. cap. 5.

negat, idem altera de eodem, secundum idem, affirmat: Id vero fieri nec natura patitur, nec sensus ipse communis. Quare,

a. Si Universalis vera sit, particularis, quæ sub ea continetur, vera est. Et

β. Si particularis falsa sit, Universalis, quæ eam continet, falsa est: Quoniam enim Subjectum in Universali distribuitur, fit, ut in ea, et in Particulari, idem, de eodem, secundum idem, dicatur: vere igitur et falso simul dici, (hoc est, affirmari simul et negari) nequit.

2. Contrariæ A. E. non possunt esse *simul veræ*: sed in materia contingenti sunt *simul falsæ*. Nam 1°. Exponatur Universalis vera; Ergo particularis vera per 1. *a*; Ergo quæ particulari contradicit falsa per 1. Sed hæc est Expositæ contraria.

2°. Exponatur Universalis de materia contingenti; Ergo et hæc falsa est, et Particularis vera, vi materiæ: Ergo quæ particulari contradicit falsa per 1. Sed hæc est Expositæ Universali contraria.

3. Subcontrariæ I. O. *simul falsæ* esse non possunt: sed *simul veræ*, vel *una vera, falsa altera*, esse possunt. Sunt enim duæ duarum Contrariarum Contradictoriæ, ut in Schemate patet, cum contrariis decussatim comparandæ. Quare, (per 1. et 2.) Subcontrariæ sunt in nulla materia *simul falsæ*; quia contrariæ in nulla *simul veræ*: Subcontrariæ in contingenti *simul veræ*; quia Contrariæ in eadem *simul falsæ*. In Impossibili vero,

et Necessaria, eadem utrisque lex est, ut sit una vera, falsa altera.

4. Subalternæ A. I. vel E. O. et *simul veræ*, et *simul falsæ*, et *una vera, falsa altera*, esse possunt. Nam 1°. Si subalternans (nempe Universalis) vera sit, Subalternata (sive Particularis) vera est (per 1. *α.*) 2°. Si Subalternata falsa, Ergo Subalternans falsa (per 1. *β.*) 3°. Si Subalternans falsa, Ergo quæ illi contradicit vera (per 1.) Ergo hujus Subcontraria, quæ est Expositæ subalternata, vera vel falsa esse potest (per 3.) 4°. Si Subalternata vera, Ergo quæ illi contradicit falsa (per 1.) Ergo hujus Contraria, quæ est expositæ Subalternans, vera vel falsa esse potest (per 2.)

§. 5. *CONVERTI* dicitur Propositio, cujus extrema An. Pr. I. transponuntur¹. Variis id modis fieri potest, sed²

¹ The logical, as distinguished from the grammatical proposition, is properly of the form distinguished as *tertiæ adjacentis*, and the copula is always in the present tense. For Logic considers words only as the signs of thought; and the copula indicates the present union of two notions in the mind of the thinker, not the past or future connection of facts narrated or predicted. Every proposition should therefore, before conversion, be stated in the form *A is B*, which by conversion becomes *B is A*, with a change, if necessary, in the quantity. To give more minute directions would be to encroach upon the province of the Grammarian: we must be guided by the idiom of the language we are using. In Latin, e. g. the substantive acquires an adjective power, and the adjective a substantive, without change of form; e. g. "nullus sapiens est iracundus," "nullus iracundus est sa-

præsertim duobus^a: 1. *Simpliciter*, quando tam quantitas, quam utraque qualitas servatur. 2. *Per accidens*^a, quando servata qualitate, quantitas mutatur.

f Ec I Simpliciter convertitur Ev A per Acci^b et conversio utrobique illativa est.

piens." In English we must say, "No angry man is wise." Rules on this point are extra-logical.

The directions of some logicians as to the conversion of past and future time, e. g. "nullus senex erit puer," are also, logically speaking, out of place here, though practically helps to a beginner. For these tenses not being logical copulæ, the sentence is not, as it stands, a logical proposition; and should be reduced to such, before it comes into the hands of the converter.

^a Aristotle's account of conversion differs somewhat from this. He divides conversion into universal and particular, according to the quantity of the proposition *after conversion*. Consequently E is converted *universally*, A and I *particularly*. He does not recognise any conversion of O. Simple conversion, (*ἀπλὴ ἀντιστροφή*), is mentioned by Philoponus, Scholia, p. 148. b. 21. Boethius uses the terms *generalis* and *per accidens*. In the system of Sir W. Hamilton, by assigning a quantity to the predicate of every proposition, the various kinds of conversion are reduced to that of simple conversion alone.

^a *Per accidens*; so called because it is not a conversion of the universal *per se*, but by reason of its containing the particular. For the proposition "Some B is A," is *primarily* the converse of "Some A is B," *secondarily* of "All A is B." See Boethius, de Syll. Cat. p. 589.

^b *A st O, per contra; sic fit conversio tota.*

Conversion by contraposition, which is not employed by Aristotle, is given by Boethius in his first book, *De Syllogismo Categorico*. He is followed by Petrus Hispanus, who first gives the mnemonic, as above. It should be ob-

Nam 1. sit vera E° , puta *Nullum A est B*: Ergo (cum uterque terminus distribuatur) quodvis A

served, that the old Logicians, following Boethius, maintain, that in conversion by contraposition, as well as in the others, the *quality* should remain unchanged. Consequently the converse of "All A is B" is "All not B is not A," and of "Some A is not B," "Some not B is not A." It is simpler, however, to convert A into E and O into I, ("No not B is A;" "Some not B is A,") as is done by Wallis and Abp. Whately; and before Boethius by Apuleius and Capella, who notice the conversion, but do not give it a name. The principle of this conversion may be found in Aristotle, Top. ii. 8. 1. though he does not employ it for logical purposes.

^c *Sit vera E.* This is the proof given by Theophrastus and Eudemus. (Alexander, Scholia, p. 148. b. 29.) Aristotle proves it by the method called *ἐκθεσις*, i. e. by the *exhibition* of an individual instance, (*ἐκτιθέναι exponere sensui*; whence a syllogism with singular premises is called *sylogismus expositivus*.) Thus, No A is B, therefore No B is A, for if not, Some *individual* B, say C, is A. Then C is both A and B, and therefore it will not be true that No A is B; which was the original proposition. Aristotle does not assume the conversion of I to prove that of E, which would be arguing in a circle. For a fuller account, see Hamilton on Reid, p. 696.

Alexander himself offers a third proof by syllogism in the first figure. No A is B, therefore No B is A; for suppose "Some B is A," and "No A is B," \therefore Some B is not B.

Having proved the conversion of E, those of A and I will follow from it. "All A is B, therefore Some B is A;" or else No B is A, and therefore (by conversion) No A is B; whereas we assumed All A is B. And again, Some A is B, therefore Some B is A; or else No B is A, and therefore No A is B.

For these proofs, the only assumption necessary is the principle of contradiction. But proof of any kind is superfluous. Conversion and other immediate inferences are necessary results of the laws of thought, equally evident

differt a quovis B. Ergo vicissim: Ergo *Nullum B est A*. 2. Sit vera I: Ergo falsa est ejus Contradictoria E: Ergo et contradictoriæ simpliciter conversa: Ergo quæ conversæ contradicit, (i. e. expositæ simpliciter conversa,) est vera. 3. Sit vera E. Ergo et ejus simpliciter conversa: Ergo et conversæ subalternata: quæ est expositæ conversa per accidens. 4. Sit vera A; Ergo et ejus subalternata: Ergo et subalternatæ simpliciter conversa: quæ est expositæ per Accidens^d.

Ceteræ Conversiones^e, cum sint partim ambiguæ,

and more direct than the mediate inferences by syllogism. Neither process is dependent on the other.

^d In Conversion, as in Opposition, Singular Propositions have been neglected by Aldrich. Concerning these, the following extract from Wallis may assist the learner. "Propositio *Singularis*, (sive Affirmativa sive Negativa,) cum semper *Universalis* sit, observat leges aliarum *Universalium*. Puta, *Virgilius est Poeta*; ergo *Aliquis Poeta est Virgilius*. Item, *Virgilius non est Græcus*; ergo *Nullus Græcorum est Virgilius*. Atque in aliis similiter.

"Si autem *Convertendæ* propositionis *Prædicatum* sit *Individuum*, (quodcunque habuerit *Subjectum*), *Convertentis Subjectum* (quippe quod fuerat *Convertendæ Prædicatum*) *Individuum* erit; propterea et *Propositio Cónvertens* (siqua sit) necessario erit *Singularis*, adeoque *Universalis*." See also Reid's Works, ed. Hamilton, p. 697.

^e *Ceteræ conversiones*. For the benefit of the curious, we quote the following: "Tres igitur sunt famosæ apud Logicos conversionis species. Dico famosæ, quoniam nonnulli moderni invenerunt duas alias conversionis species, quarum una est conversio propositionum nullius quantitatis, ut exclusivæ et reduplicativæ. Nam sic convertitur exclusiva; tantum homo est rationalis, omne rationale est homo: reduplicativa

partim falsæ, partim ad præcepta Syllogismorum inutiles, in Logica negliguntur^f.

autem sic convertitur: homo in quantum homo est rationalis, rationale est homo in quantum homo. Item propositionum modalium, ut hominem esse album est possibile, ergo possibile est hominem esse album. Item alii imaginati sunt duas alias species. Prima est quando mutatur qualitas et non quantitas, ut hic; omnis homo est animal, omne animal non est homo. Secunda est quando mutatur quantitas et qualitas, ut hic; omnis homo est animal, aliquod animal non est homo. Verum quia hujusmodi conversiones non sunt in usu, nec nobis deserviunt pro reductione syllogismorum, ideo immorabimur circa primam et secundam speciem, tangentes breviter de tertia, omnibus aliis relictis." Javellus, de Propositione, cap. ii.

^f Is the converse an inference from the exposita, or, as Whately says, the same judgment in another form? This was an early point of dispute among the Schoolmen. See Albert. in Anal. Pr. Tract. i. cap. 8. Aristotle clearly considers it an *inference*; otherwise it would be absurd to prove it. Reid, in his Account of Aristotle's Logic, defines it as an inference, and the definition is accepted by his learned Editor. Kant, too, regards both conversion and opposition as *syllogisms of the understanding*, the new judgment being always different in form, though not in matter, from the old. As regards conversion *per accidens*, the exposita is clearly not identical with the converse; as it cannot be substituted for it, but may be false, while the converse is true. But on the new system of Sir W. Hamilton, the predicate being quantified, and the proposition reduced to an equation between the terms, it is better to consider the converted proposition as identical with the exposita.

CAP. III.

De Syllogismo Categorico puro.

§. 1. TERTIA pars Logicæ agit de *Argumento*^a sive *Syllogismo*, quod est signum tertiæ operationis intellectûs: nempe *Discursus*, vel *Ratiocinium* Propositionibus expressum.

Quare, cum Discursus^b sit progressus mentis ab uno iudicio ad aliud, perspicuum est in eo requiri
1. Aliquid unde discursus ordiatur. 2. Aliud quo perveniat. 3. Ea sic ab invicem pendere, ut unum ex alio, et aliûs vi innotescat; secus enim, unum post aliud cognoscere, est tantum sæpe iudicare.

Anal. Post.
I. 1. 1.

Jam, ex quo aliud cognoscendum est, ipsum certe præcognosci debet; et proinde quasi sine discursu notum, *antecedere, poni, præmitti*: et ex eo reliquum *concludi, colligi, inferri et sequi* dicitur. Est autem duplex *consequentia*:

1. *Materialis*; quando ex Antecedente Consequens infertur, sola vi Terminorum^c, quæ est

^a *Argument* is not properly synonymous with syllogism, but with the middle term only. See Ed. Rev. No. 115. p. 218.

^b See before, p. 5. note k.

^c The *force of the terms* leads to a conclusion by suggesting to the mind certain additional truths concerning the things spoken of, which are not *given* in the premises. But this additional knowledge is clearly extralogical. See Appendix, note D. The *matter* of the syllogism is all that is given *to and out of* the act of reasoning: the *form* is what is conveyed

Argumenti materia: ut, Homo est animal. Ergo est vivens.

2. *Formalis*; quando infertur propter ipsum colligendi modum, quæ est *argumenti forma*; ut, *B est A. C est B. Ergo C est A.* Mutatis terminis et servata eorum dispositione, Materialis plerumque fallit, Formalis semper obtinet: et proinde hæc solum in Logica spectatur, illa, tanquam mutabilis et lubrica, negligitur.

Hisce intellectis, opinor satis constare quo sensu ^{Anal. Pr. I. 1. 6.} definiatur *Syllogismus*; ^{Top. I. 1. 2.} *Oratio in qua positis qui-*

in and by the act itself. The former is expressed in the *terms* of which the reasoning is composed, and which vary in every different act of thought; the latter appears in the *relation* in which those terms are thought to one another, as constituting *premises* which necessitate a *conclusion*. This remains within certain fixed limits in every different act of thought. The same principle of distinction may be applied to discern between the matter and form of concepts and judgments. The logical forms of the syllogism are exhibited in *mood* and *figure*, as those of the proposition in *quality* and *quantity*. Cf. Burgersdyck. *Inst. Log.* l. ii. c. 6. "Forma syllogismi est apta trium propositionum dispositio ad conclusionem ex præmissis necessario colligendum. Hæc aptitudo posita est in figura et modo." A distinction slightly varying from the above will be found in Crakanthorpe, *Logica*, l. iii. c. 13. and another in Kant, *Logik*, §. 59. The latter has been censured by Krug, *Logik*, §. 72.

^d Arist. Anal. Pr. i. 1. 6. Συλλογισμὸς δὲ ἐστὶ λόγος ἐν ᾧ τεθέντων τινῶν ἕτερόν τι τῶν κειμένων ἐξ ἀνάγκης συμβαίνει τῷ ταῦτα εἶναι. See also, Top. i. 1. 2. The latter definition is translated by Aulus Gellius, xv. 26. "Oratio in quâ, consensus quibusdam et concessis, aliud quid, quam quæ concessa sunt, per ea, quæ concessa sunt, necessario conficitur." The word *concessis*

busdam atque concessis, necesse est aliud evenire præter et propter ea quæ posita sunt atque concessa.

§. 2. MULTÆ sunt ejus species ; sed una tantum præsentis instituti ; nempe *Categoricus simplex*, i. e. qui constat tribus Propositionibus de inesse*. E quibus duæ priores sunt Antecedens, tertia Consequens ; quæ extra Syllogismum spectata (scil. quamdiu hæret in incerto) *Problema*[†] ; et *Quæstio*[‡] dicitur ; in Syllogismo autem (nempe post fidem factam) *Conclusio*. Quæstionis duo sunt extrema, Subjectum et Prædicatum ; quorum de Convenientia vel Dissidio inquiritur, ope termini

Anal. Pr.
I. 4. 15.
I. 26. 1.
Anal. Post.
II. 1. 1.

is too limited ; being strictly true only of the topical syllogism. Cf. Trendelenburg, *Elementa*, §. 21. On the charge of *petitio principii*, sometimes brought against the syllogism, see Appendix, note E.

* i. e. pure Categoricals.

† Τὸ γὰρ αὐτὸ γένει πρόβλημα καὶ λῆμμα καὶ ὁμολόγημα καὶ συμπεράσμα καὶ ἀξίωμα· πάντα γὰρ προτάσεις τῇ σχέσει τὴν διαφορὰν ἔχοντα· προτιθέμενον γὰρ εἰς δεῖξιν ὥς μὴ γινώριμον πρόβλημα καλεῖται, λαμβανόμενον δὲ εἰς ἄλλον δεῖξιν λῆμμα καὶ ὁμολόγημα· ἀξίωμα δὲ ὅταν ἀληθὲς ᾖ καὶ ἐξ ἐαυτοῦ γινώριμον, δεδειγμένον δὲ συμπεράσμα. Alexander, Schol. p. 150, b. 40. This accords with the sense of πρόβλημα in Anal. Pr. i. 4. 15. i. 26. 1. The dialectical use of the term in disputation is not very different. Cf. Topics, i. 4. 1, 3. i. 11. 1. Schol. p. 256, a. 14.

‡ *Quæstio* ; τὸ ζητούμενον, Anal. Post. ii. 1. 1. which term, however, has a more extensive application than is here assigned ; for two of the *Quæstiones Scibiles*, *an sit* and *quid sit*, cannot in all cases be determined syllogistically. See An. Post. ii. 3. and Appendix, note C.

alicujus tertii; idque propter Canones sequentes^h, in quibus vis omnis Syllogistica fundatur.

1. Quæ conveniunt in uno aliquo eodemque tertio, ea conveniunt inter se.

^h These Canons are an attempt to reduce all the three figures of syllogism directly to a single principle; the *dictum de omni et nullo* of Aristotle, which was universally adopted by the scholastic Logicians, being directly applicable to the first figure only. This reduction, so long as the predicate of propositions has no expressed quantity, is illegitimate; the terms not being equal, but contained one within another, as is denoted by the names *major* and *minor*. Hence, as applied to the first figure, the word *conveniunt* has to express, at one and the same time, the relation of a greater to a less, and of a less to a greater,—of a predicate to a subject, and of a subject to a predicate. In the system of Sir W. Hamilton, by assigning a quantity to the predicate, the terms of every proposition are equal in extent; and the Canons become legitimate representatives of the syllogism; but in this case they are only narrower statements of the true syllogistic laws; which are given in the Principles of Identity and Contradiction. (Every A is A; No A is not A.) These, with the Principle of Excluded Middle, (Every thing is either A or not A,) are the highest and most exact statements of the Necessary Laws of Thought. Cf. *Prolegomena Logica*, p. 223.

Wallis mentions the Canons as recent innovations in Logic. "Nonnulli autem Logici, (nostri seculi aut superioris,) posthabita veterum probatione per *Dictum de Omni et de Nullo*, aliud substituunt illius loco Postulatum; nimirum, *Quæ conveniunt in eodem tertio conveniunt inter se*. *Inst. Log.* l. iii. c. 5. Cf. Bacon. *Nov. Org.* l. ii. aph. 27. Melancthon (*Erotemata*, p. 172.) mentions them as adopted by a sect of Logicians in his day. The earliest writer in whom I have found them is Rodolphus Agricola, *De Inv. Dial.* i. 2. He describes at considerable length the office of the middle term as a measure of equality or inequality.

2. Quorum unum convenit, alterum differt uni et eidem tertio, ea differunt inter se.

3. Quæ non conveniunt in uno aliquo eodemque tertio, ea non conveniunt inter se.

Sunto enim A et C, nec assignari possit ejusmodi tertium, Ergo nihil habent commune; Ergo non conveniunt inter se.

4. Quorum neutri inest quod non sit in alio, ea non differunt inter seⁱ.

5. Quæ non probantur convenire in uno aliquo eodemque tertio, ea non probantur convenire inter se. Dubitari enim potest utrum detur ejusmodi tertium, et dubitatio ista non tollitur.

6. De quibus non probatur, convenire unum eidem alicui tertio cui alterum differt, ea non probantur differre inter se. Dubitari enim potest, utrum detur ejusmodi tertium, h. e. utrum alterutri insit quod non est in reliquo; et dubitatio ista non tollitur^k.

ⁱ The third and fourth canons relate to conditions under which no syllogism *can* exist. "Two things, which have not a point in common, are totally distinct." "Two things, which have not a point of difference, are undistinguishable." But if there is no such point, there is no middle term, and therefore no syllogism.

^k The fifth and sixth canons relate to conditions under which no syllogism *does* exist. "If no point has been assigned, whether of agreement or difference." But if so, there is no syllogism.

Hence these four cannot be called canons of syllogism. They may be useful, however, for examining the illogical positions of an opponent.

§. 3. Ex sex hisce Principiis Syllogismi structura sic deducitur.

1. In omni Syllogismo sunt tres, et tres tantum, ^{Anal. Pr. I. 25. 1.} termini. Nam Syllogismus¹ omnis probat aliquam conclusionem: Et in illâ sunt duo tantum extrema: Et illa neque convenire, neque differre probatur, sine uno, unoque tantum, tertio.

Jam, Prædicatum Quæstionis dici solet *majus* ^{Anal. Pr. I. 4. 8. I. 5. 1. I. 6. 1. I. 5. 7.} *extremum*^m, *major terminus*; Subjectum Quæstionis, *minor*; Terminus vero tertius, cui quæstionis extrema comparantur, Aristoteli *Argumentum*, ^{Anal. Pr. I. 32. 8. I. 4. 3. I. 5. 1. I. 6. 1.} vulgo *Medium*ⁿ: Nam Prædicatum Quæstionis plerumque amplius est Medio; hoc minori.

¹ Aristotle adopts an inverse method; first examining the structure and stating the laws of each separate figure of syllogism, in An. Pr. i. ch. 4, 5, 6. and afterwards enumerating, as the result of the examination, the general laws applicable to all, in An. Pr. i. 28 sqq. On the respective merits of the two methods, see Pacius on An. Pr. i. 4. Reid, ed. Hamilton, p. 700.

^m *Majus extremum*; τὸ μείζων ἄκρον, (also τὸ πρῶτον, An. Pr. i. 31. 2.) *minus*; τὸ ἐλάττω, (also τὸ ἑσχατον, An. Pr. ii. 8. 3.) *Terminus*, ὁρος, for the various meanings of which, see Waitz, vol. i. p. 370. *Major term*; μείζων ὁρος: *minor*; ἐλάττω ὁρος, An. Pr. i. 5. 7. The definitions of the major and minor terms given in the text are condemned by Pacius, (on An. Pr. i. 7.) as inapplicable to the indirect moods. Aristotle gives a separate definition of the three terms in each figure. But the indirect moods may, without loss, be dispensed with.

ⁿ More correctly, "Aristoteli *medium*, Ciceroni aliisque *argumentum*." See Ed. Rev. No. 115. p. 218. The nearest Greek equivalent to *argumentum* is πῶτις, which, however, as employed by Aristotle, is a rhetorical, not a logical term. The origin of Aldrich's blunder it is difficult to conjecture.

Anal. Pr. I. 23. 5. I. 25.
8. I. 32. 8. 2. In omni Syllogismo sunt tres, et tres tantum, propositiones. Duæ præmissæ°, in quibus Medium cum extremis seorsim conferatur, (nempe *Major*, in qua cum majori; *Minor*, in qua cum minori;) una *Conclusio*, in qua extrema invicem committantur.

N.B. 1. Quod Major dici solet simpliciter *Propositio*; Minor, *Assumptio*°. 2. Quod Medium non ingreditur conclusionem, alias idem per idem probaretur: adeoque non essent tres termini.

Anal. Pr. I. 32. 10.
Soph. Elench. 4. 1. 3. Ancipiti medio nihil conficitur. Neque enim affertur in hoc casu unum aliquod idemque tertium vel in quo extrema conveniant, vel cui unum conveniat, alteram differat.

Anal. Pr. I. 24. 1. 4. Medium non distributum^a est anceps. Esto

° *Major premise*; ἡ πρὸς τῷ μείζονι ἄκρῳ πρότασις. *Minor premise*; ἡ πρὸς τῷ ἐλάττωι ἄκρῳ πρότασις. *Conclusion*; συμπεράσμα, which also signifies *minor term*, Anal. Pr. ii. 14. The *premise* is not, properly speaking, called ὅρος by Aristotle. In such expressions as καθόλου ὄντων τῶν ὄρων, (Anal. Pr. i. 5. 2.) there is an ellipsis of πρὸς τὸν ἕτερον, and the phrase means strictly, that one *term* is predicated *universally* of the other, i. e. of the whole of the other.

^p As by Cicero, de Invent. i. 37. Fortunatianus, Rhet. lib. ii. Cassiodorus, de Art. ac Disc. ch. 2. Boethius, de Syll. Hyp. p. 614. The terms are of Rhetorical origin. Quintilian calls the major premise, *Intentio*; Inst. Orat. v. 14. The conclusion is called *complexio*; a term also applied by Cicero to the Dilemma; de Inv. i. 29.

^a *Distribution* is not an Aristotelian term. It forms part of what the Schoolmen call *parva logicalia*; a kind of appendix to analyses of the Organon; containing matters, some evolved from, though not distinctly treated of by Aristotle, others com-

enim B terminus communis in b et β divisibilis; Ergo b et β sunt opposita: et tamen vere dicitur Aliquod B est b et Aliquod B est β . Quare aliquod B est Medium anceps.

5. Quare Medium in præmissis semel ad minimum distribui debet; sufficit tamen, si vel semel distribuatur. Nam 1. ad probandum A est C, conveniat C alicui B, et A omni; Ergo eidem alicui B: Ergo affertur unum aliquod idemque tertium &c. 2. ad probandum A non est C, conveniat C alicui B, et A differat omni; Ergo eidem alicui B: Ergo affertur &c.

6. Processus ab extremo non distributo in præmissis, ad idem distributum in conclusione, vitiosus est. Nam ex *aliquo* non sequitur *omne*. Esto enim verum quod aliquod; Ergo potest esse verum quod aliquod non; (nam Subcontrariæ possunt esse simul veræ;) Ergo de aliquo potest affirmari quod non de omni. Esto rursus verum quod aliquod non: Ergo potest esse verum quod aliquod: Ergo de aliquo potest negari quod non de omni.

plete innovations, more properly belonging to Grammar than to Logic. The greater part of these first appear in Petrus Hispanus. See *Summulae Logicales*, Tr. 7.

The syllogistic rules concerning distribution are of course implied in Aristotle's account of each figure, though not enunciated separately as common to all. Thus, to say that the major premise in fig. 1. must be universal, or one premise in fig. 2. negative, is equivalent to a rule for distributing the middle term. The particular conclusion in fig. 3. in like manner forbids an illicit process of the minor term.

Anal. Pr.
I. 24. 1.

7. Præmissis negantibus nihil probatur: Affer-
tur enim tertium cui utrumque extremum differt;
non autem cui vel utrumque conveniat, vel unum
conveniat, alterum differat.

8. Si præmissarum altera sit negativa, erit etiam
Conclusio. Nam præmissarum reliqua est affirma-
tiva: Ergo extremorum unum differt medio, alte-
rum convenit: Ergo extrema differunt inter se:
Ergo conclusio est negativa.

Anal. Pr.
I. 24. 4.

9. Contra, si Conclusio sit negativa, erit etiam
altera præmissarum. Nam extrema differunt inter
se: Ergo eorum unum convenit medio, alterum
differt: Ergo præmissarum altera affirmat, reliqua
negat.

Anal. Pr.
I. 24. 1.

10. Præmissis particularibus nihil probatur. Nam
præmissarum altera affirmat: Ergo in illa medium
non distribuitur: Ergo distribui debet in reliqua:
Ergo illa est negativa in qua medium prædicatur:
Ergo conclusio negativa: Ergo prædicatum ejus
distribuitur, quod in præmissis non est distributum;
Fuit enim vel affirmativæ terminus alter, vel sub-
jectum negativæ; horum vero nullus distribuitur.

Anal. Pr.
I. 24. 3.

11. Si præmissarum altera particularis sit, con-
clusio quoque particularis est. Sit enim 1. Præ-
missarum altera particularis affirmativa; Ergo in
illa nec extremum suum nec medium distribuitur:
Ergo medium distribuitur in reliqua, quæ etiam
Universalis est, sitque 1. Affirmativa: Ergo in illa
medium subjicitur, et extremum medio attributum
non distribuitur: Ergo neutrum extremorum dis-

tribuitur in præmissis: Ergo neutrum in conclusione: Ergo conclusio particularis affirmativa est. Sit 2. Negativa: Ergo conclusio negativa: sed debet habere extremum non distributum: Ergo particularis negativa est.

Sit 2. Præmissarum altera particularis negativa: Ergo Reliqua Universalis affirmativa: Ergo in præmissis duo tantum termini distribuuntur: Ergo Conclusio habet extremum non distributum: Ergo cum negativa sit, erit etiam particularis.

12. Quod si Conclusio^r particularis sit, non necesse est præmissarum alteram particularem esse. Fieri enim potest, ut instituto meo sufficiat subalternata, quando subalternans potuit inferri. Et cum illæ sint simul veræ, liberum est utramvis inferre. Quanquam stricte loquendo, Argumentatio non est accurata; nam Subalternatæ veritas non immediate deducitur ex præmissis, sed ex subalternante.

An. Pr. I.
21. 8.

Syllogismi generales regulas complectitur hoc Tetrastichon^a.

^r This rule is given by Aristotle, not with reference to the subaltern moods, but to the third figure, in which two universal premises only warrant a particular conclusion. An inverse rule of inference holds with regard to truth and falsehood: two true premises necessitate a true conclusion; but the truth of the conclusion does not guarantee that of the premises. Cf. An. Pr. ii. 2. 1.

^a The earliest form of this mnemonic is that given by Petrus Hispanus:

Partibus ex puris sequitur nil, sive negatis.

Si qua præit partis, sequitur conclusio partis.

Distribuas medium; nec quartus terminus adsit.
 Utraque nec præmissa negans, nec particularis.
 Sectetur partem Conclusio deteriore.
 Et non distribuat, nisi cum præmissa, negetve.

§. 4. SUPEREST per hasce regulas inquirere, quot modis componi possunt tres Propositiones de inesse, ut Syllogismus conficiant. Qua in inquisitione duo spectanda sunt.

1, *Modus*[†], sive legitima determinatio Pro-

Si qua negata præit, conclusio sitque negata.

Lex generalis erit, medium concludere nescit.

[†] Mood (*τρόπος*) is not in this sense an Aristotelian expression, (unless possibly in An. Pr. i. 28. 14?); but it is found in his Greek commentators. See Alexander, Schol. p. 150, b. 8. Aristotle in the same sense employs *πῶσις*, An. Pr. i. 26. 1. He does not adopt an arithmetical calculation of possible moods distinct from considerations of figure, but shews, in each figure separately, what combinations of propositions are admissible, and what not. It may be observed, that the earliest scholastic Logicians do not consider Mood as composed of three propositions, but of the two premises only. Thus Petrus Hispanus defines “ordinatio *duarum* propositionum in debita qualitate et quantitate;” so Aquinas, in Opusc. xlviii. de Syll. ch. 4. In this case the number of possible moods is only sixteen.

This computation is preferable to Aldrich's, because simpler; but neither has any *logical* value. The *legitimate determination* ought to be such as the laws of Logic require; not one which arises from a mere arithmetical calculation. On logical grounds, there are eight valid combinations of premises; viz. AA. AE. AI. AO. EA. EI. IA. OA. The conclusion, being determined by the premises, cannot properly be reckoned as an independent element in the combinations. Cf. Fries, *System der Logik*, §. 57.

positionum secundum Quantitatem et Qualitatem.

2. *Figura*, sive legitima dispositio Medii cum partibus Quæstionis.

Modi sunt in universum 64. Nam, ut supra ostensum est, ad Syllogismum faciunt Propositiones tantum quatuor A, E, I, O. Quare concipi potest Quadruplex tantum Major in Syllogismo; cuilibet vero Majori quadruplex tantum Minor adjungi; unde 16. paria præmissarum: et singulis præmissis quadruplex tantum Conclusio; unde 64. Modi Syllogismorum.

AAA. AAE. AAI. AAO. *AEA. AEE. AEI. AEO. *AIA. AIE. AII. AIO. *AOA. AOE. AOI. AOO.

EEA. EAE. EAI. EAO. *EEA. EEE. EEI. EEO. *EIA. EIE. EII. EIO. *EOA. EOE. EOI. EOO.

IAA. IAE. IAI. IAO. *IEA. IEE. IEI. IEO, *IIA. IIE. III. IIO. *IOA. IOE. IOI. IOO.

OAA. OAE. OAI. OAO. *OEA. OEE. OEI. OEO. *OIA. OIE. OII. OIO. *OOA. OOE. OOI. OOO.

Ex his excluduntur sedecim per Regulam 7. propter præmissas negantes, viz. EEA. EEE. EEI. EEO. *EOA. EOE. EOI. EOO. *OEA. OEE. OEI. OEO. *OOA. OOE. OOI. OOO. Duodecim per Reg. 10. propter præmissis particulares, viz. IIA. IIE. III. IIO. *IOA. IOE. IOI. IOO. *OIA. OIE. OII. OIO. Duodecim per Reg. 8. quia

præmissarum altera negat, sed non Conclusio, viz. AEA. AEI. AOA. AOI. *EAA. EAI. EIA. EII. *IEA. IEI. *OAA. OAI. Octo per Reg. 11. quia præmissarum altera particularis est, sed non Conclusio, viz. AIA. AIE. AOE. *EIE. *IAA. IAE. *IEE. *OAE. Denique quatuor per Reg. 9. quia Conclusio negativa est sed neutra præmissarum, viz. AAE. AAO. AIO. *IAO.

Excluduntur igitur in universum Modi $52 = 16 + 12 + 12 + 8 + 4$. e quibus multi contra plures regulas peccant, quamvis una tantum notetur.

Supersunt ($64 - 52 =$) 12 Modi ad Syllogismum utiles, viz. AAA. AAI. AEE. AEO. AII. AOO. *EAE. EAO. EIO. *IAI. IEO^u. *OAO.

§. 5. FIGURÆ^x Syllogismorum sunt 4. Nam

^u IEO has been condemned ever since the days of Apuleius, as far as the second and third figures are concerned. It was sometimes allowed in the first, as the indirect mood Frisesmo, but should not have been retained by Aldrich, who does not recognise the indirect moods. With a direct conclusion, it manifestly produces an illicit process of the major term.

^x *Figure*, σχήματα, An. Pr. i. 4. 15. "Figuras syllogismorum, quæ dicuntur (Apuleius 'formulas' vocat), ab Aristotele appellatas esse Jul. Pacius putat, quia figuris geometricis adscriptis syllogismi ab eo illustrati sint. Equidem hanc vocem non tam a geometricis petitam quam de ipso ordine terminorum accipiendam putaverim, quem σχῆμα appellari licebit, etiam si de geometricis figuris non cogitur: sic enim supra commemoravimus τὰ σχήματα τῆς κατηγορίας (Metaph. v. 2. 1.), τὸ σχῆμα τῆς ιδέας (Metaph. vi. 3. 2.), τὰ σχήματα τῆς λέξεως (Poet. 19. 7.), σχῆμά τι δημοκρατίας (Polit. vi. 4. 5.)." Waitz, vol. i. p. 384.

Medium, quod cum utroque extremo comparatur, vel 1. subjicitur majori et tribuitur minori, et fit

Aristotle acknowledges only three figures; looking rather to the extension of the middle term, as compared with the other two, than to its position in the two premises. In this point of view there are only three figures possible; for the relative extensions of the major and minor terms being given, the middle can only have three positions: between the other two, as in the first figure; greater than both, as in the second; or less than both, as in the third. See Trendelenburg, Elem. §. 28. Waitz on Anal. Pr. i. 23. 7. The invention of the fourth figure is attributed by Averroes (on Anal. Pr. i. 8.) to Galen. The latter may possibly have first called the five moods by that name, but they were known at a much earlier period as indirect moods of the first figure. An indirect mood is one in which we do not infer the immediate conclusion, but its converse. Consequently, the predicate of the conclusion, which in a direct mood is the *major* term, is in an indirect one the *minor*. The five indirect moods of the first figure were called Baralip, Celantes, Dabitis, Fapesmo, Frisesmo. The three first are clearly Barbara, Celarent, Darii, with the conclusions converted. With regard to the two last, the process is a little more intricate. They have negative minor premises, and thus offend against a special rule of the first figure; but this is checked by a counterbalancing transgression. For by simply converting O, we alter the distribution of the terms, so as to avoid an illicit process. Thus,

All B is A (fap)	Some B is A (fris)
No C is B (esm)	No C is B (esm)
Therefore Some A is not C (o)	Therefore Some A is not C (o)
Where to infer "Some C is not A," would involve an illicit process of the major term.	Where to infer "Some C is not A," would involve an illicit process of the major term.

The invention of these indirect moods is attributed to Theophrastus; not, however, on the authority of Apuleius, as

figura prima; vel 2. tribuitur utrique, et fit *secunda*; vel 3. subjicitur utrique, et fit *tertia*; vel 4. tribuitur majori et subjicitur minori, et fit *quarta*. Quæ omnia sequenti Schemate declarantur.

*Dispositio trium terminorum, scilicet majoris
A. medii B. minoris C. in Figura.*

1.	2.	3.	4.
B. A.	A. B.	B. A.	A. B.
C. B.	C. B.	B. C.	B. C.
C. A.	C. A.	C. A.	C. A.

Quare quælibet Figura excludit adhuc sex modos'. Nempe

asserted by M. St. Hilaire, but on that of Alexander, Schol. p. 153, a. 47. But they are clearly recognised by Aristotle; the last two in Anal. Pr. i. 7. 1. the first three in Anal. Pr. ii. 1. 2. The passage in Apuleius does not refer to the *indirect*, but to the *indefinite*, syllogism.

γ Certain moods, not excluded by the general rules of syllogism, are rejected in some one figure, by what are called the special rules of that figure. These special rules are given as follows by Petrus Hispanus.

- Fig. 1. { 1. Minore existente negativa nihil sequitur.
2. Majore existente particulari nihil sequitur.
- Fig. 2. { 1. Majore existente particulari nihil sequitur.
2. Ex puris affirmativis nihil sequitur.
3. In secunda figura semper concluditur negative.
- Fig. 3. { 1. Minore existente negativa nihil sequitur.
2. In tertia figura conclusio debet esse particularis.

These rules are all to be found in An. Pr. i. ch. 4, 5, 6. Of the fourth figure three special rules have been framed; viz. 1. " Quando major est affirmativa, minor semper est uni-

1. Propter Medium non distributum. Prima duos IAI. OAO. Secunda quatuor AAA. AAI. AII. IAI. Quarta duos AII. AOO.

2. Propter processum majoris illicitum. Prima quatuor AEE. AEO. AOO. IEO. Secunda duos IEO. OAO. Tertia quatuor AEE. AEO. AOO. IEO. Quarta duos IEO. OAO.

3. Propter processum minoris illicitum. Tertia duos AAA. EAE. Quarta duos AAA. EAE.

Supersunt Modi certo et necessario concludentes
24. sex in qualibet Figura.

I.

<i>bAr</i>	Omne	B	est	A
<i>bA</i>	Omne	C	est	B: <i>Ergo</i>
<i>rA</i>	Omne	C	est	A.
<i>cE</i>	Nullum	B	est	A
<i>lA</i>	Omne	C	est	B: <i>Ergo</i>
<i>rEnt</i>	Nullum	C	est	A.
<i>dA</i>	Omne	B	est	A
<i>rI</i>	Aliquod	C	est	B: <i>Ergo</i>
<i>I</i>	Aliquod	C	est	A.
<i>fE</i>	Nullum	B	est	A
<i>rI</i>	Aliquod	C	est	B: <i>Ergo</i>
<i>O</i>	Aliquod	C	non est	A.

versalis." 2. "Quando minor est affirmativa, conclusio est semper particularis." 3. "In modis negativis, majorem universalem esse oportet."

A	Omne	B	est	A
A	Omne	C	est	B: <i>Ergo</i>
I	Aliquod	C	est	A.
E	Nullum	B	est	A
A	Omne	C	est	B: <i>Ergo</i>
O	Aliquod	C	non est	A.

II.

<i>cEs</i>	Nullum	A	est	B
A	Omne	C	est	B: <i>Ergo</i>
<i>rE</i>	Nullum	C	est	A.
<i>cAm</i>	Omne	A	est	B
<i>Es</i>	Nullum	C	est	B: <i>Ergo</i>
<i>trEs</i>	Nullum	C	est	A.
<i>fEs</i>	Nullum	A	est	B
<i>tI</i>	Aliquod	C	est	B: <i>Ergo</i>
<i>nO</i>	Aliquod	C	non est	A.
<i>bAr</i>	Omne	A	est	B
<i>Ok</i>	Aliquod	C	non est	B: <i>Ergo</i>
O	Aliquod	C	non est	A.
E	Nullum	A	est	B
A	Omne	C	est	B: <i>Ergo</i>
O	Aliquod	C	non est	A.

A Omne A est B
 E Nullum C est B: *Ergo*
 O Aliquod C non est A.

III.

dAr Omne B est A
Ap Omne B est C: *Ergo*
tI Aliquod C est A.

fEl Nullum B est A
Ap Omne B est C: *Ergo*
tOn Aliquod C non est A.

dIs Aliquod B est A
Am Omne B est C: *Ergo*
Is Aliquod C est A.

bOk Aliquod B non est A
Ar Omne B est C: *Ergo*
dO Aliquod C non est A.

dAt Omne B est A
Is Aliquod B est C: *Ergo*
I Aliquod C est A.

fEr Nullum B est A
Is Aliquod B est C: *Ergo*
On Aliquod C non est A.

IV.

<i>brAm</i>	Omne	A	est	B
<i>An</i>	Omne	B	est	C: <i>Ergo</i>
<i>tIp</i>	Aliquod	C	est	A.
<i>cAm</i>	Omne	A	est	B
<i>En</i>	Nullum	B	est	C: <i>Ergo</i>
<i>Es</i>	Nullum	C	est	A.
<i>dIm</i>	Aliquod	A	est	B
<i>Ar</i>	Omne	B	est	C: <i>Ergo</i>
<i>Is</i>	Aliquod	C	est	A.
<i>fEs</i>	Nullum	A	est	B
<i>Ap</i>	Omne	B	est	C: <i>Ergo</i>
<i>O</i>	Aliquod	C	non est	A.
<i>frEs</i>	Nullum	A	est	B
<i>Is</i>	Aliquod	B	est	C: <i>Ergo</i>
<i>On</i>	Aliquod	C	non est	A.
<i>A</i>	Omne	A	est	B
<i>E</i>	Nullum	B	est	C: <i>Ergo</i>
<i>O</i>	Aliquod	C	non est	A.

*Barbara**, *Celarent*, *Darii*, *Ferioque*, prioris :

* *Barbara*, *Celarent*, &c. This mnemonic first appears in the *Summulæ Logicales* of Petrus Hispanus, (see on p. 48.) But in his version the fourth figure is omitted, and its moods

Cesare, Camestres, Festino, Baroko, secundæ :
Tertia, Darapti, Disamis, Datisi, Felapton,
Bokardo, Ferison, habet : Quarta insuper addit
Bramantip, Camenes, Dimaris, Fesapo, Fresison :
 Quinque *Subalterni*, totidem *Generalibus* orti,
 Nomen habent nullum, nec, si bene colligis, usum.

§. 6. ATQUE omnes quidem 24. eatenus con-
 cludere, quod in iis convenientia vel dissidium
 extremorum certo atque necessario colligatur, ex
 Principio primo et secundo abunde constat.

Quod aliter demonstrat Aristoteles ad hunc
 modum.

Statuit primo Theorema, quod Scholastici vocant <sup>Anal. Pr. I.
1. 8.</sup>
Dictum de Omni et Nullo^a, scil. “Quod prædicatur

given as indirect moods of fig. 1. This earliest edition of these
 celebrated lines runs thus :

Barbara, Celarent, Darii, Ferio, Baralipet,
 Celantes, Dabitis, Fapesmo, Frisesmo, deinde
 Cesare, Camestres, Festino, Baroco, Darapti,
 Felapton, Disamis, Datisi, Bocardo, Ferison.

Several other versions are found in later writers. A Greek
 mnemonic of the same kind is inserted in editions of the
 Organon preceding that of Pacius. (See Buhle's Aristotle,
 vol. ii. p. 628.) It runs thus :

Fig. 1. γράμματα—ἔγραψε—γραφίδι—τεχνικός.

Fig. 2. ἔγραψε—κάτεχε—μέτριον—ἄχολον.

Fig. 3. ἀπασι—σθεναρός—ισάκис—φέριστος—ἄσπιδι—ὄμαλος.

This mnemonic is attributed by M. St. Hilaire to Nicephorus
 Blemmidas.

^a Λέγομεν δὲ τὸ κατὰ παντὸς κατηγορεῖσθαι, ὅταν μηδὲν ἢ λαβεῖν τῶν
 τοῦ ὑποκειμένου, καθ' οὗ θάτερον οὐ λεχθήσεται· καὶ τὸ κατὰ μηδενὸς

“ Universaliter de alio, (i. e. de termino distributo,) ”
 “ sive affirmative, sive negative, prædicatur similiter ”
 “ de omnibus sub eo contentis.”

ὡσαύτως, An. Pr. i. 1. 8. The same principle is implied in the first antipredicamental rule, Categ. 3. 1. ὅσα κατὰ τοῦ κατηγορουμένου λέγεται πάντα καὶ κατὰ τοῦ ὑποκειμένου ῥηθήσεται. Indeed, Aldrich's version is more nearly a translation of the latter than of the *Dictum* properly so called. Cf. Petr. Hisp. Tract. iv. “ Dicit de omni est, quando nihil est sumere sub subjecto, de quo non dicatur prædicatum. Dicit de nullo est, quando nihil est sumere sub subjecto a quo non removeatur prædicatum.”

The *Dictum de Omni et Nullo* is most improperly called a *Theorem*. This term in Aristotle is synonymous with ζήτημα, and means a proposition, the truth of which is to be inquired into, not one laid down as an axiom. See Topics, i. 11. 1. Alexander, Scholia, p. 259, a. 38.

The *dictum* is directly applicable only to the first figure, which is considered by Aristotle as the type of all syllogisms, and to which the others have to be reduced, as a necessary test of their validity. In this he is followed by Kant, *Logik*, §. 69. Other logicians enunciate distinct axioms for the second and third figures. This has been done by Lambert, *Neues Organon*, part i. ch. 4. §. 232. but he is far from happy in his enunciation of the dicta. We may state them as follows, in a somewhat improved form.

Principle of second figure. *Dictum de Diverso*.

If a certain attribute can be predicated (affirmatively or negatively) of every member of a class, any subject, of which it cannot be so predicated, does not belong to the class.

Principles of third figure. I. *Dictum de Exemplo*.

If a certain attribute can be affirmed of any portion of the members of a class, it is not incompatible with the distinctive attributes of that class.

II. *Dictum de Excepto*. If a certain attribute can be denied of any portion of the members of a class, it is not inseparable from the distinctive attributes of that class.

The natural use of the second figure, according to Lambert,

Admisso hoc Theoremate (quod axioma sponte perspicuum est) constat una, modos quatuor priores in prima certo atque necessario concludere. Nam eorum major ostendit majus extremum prædicari de medio distributo; et minor, minus extremum sub medio contineri.

Quare, Modi quatuor prædicti nihilo penitus indigent quo necessitas conclusionis appareat, præter ea quæ in præmissis posita sunt; et proinde quatuor illi sunt præ cæteris evidentes. Nam cæteri omnes aliquo vel aliquibus egent, quæ, utcunque per præmissas necessaria, in Syllogismo tamen non exprimuntur. Quare illos Aristoteles ^{An. Pr. I. 1. 7.} *perfectos*^b, hos *imperfectos* dicit; Scholastici *directos*,

is for the discovery and proof of the differences of things: that of the third, for the discovery and proof of examples and exceptions.

Concerning Lambert's imaginary principle of the fourth figure, see p. 90, note n. Lambert's principles are criticised by Krug, *Logik*, §. 109.

There is a third manner of treating the syllogistic figures; viz. by regarding them as all equally direct applications of one and the same principle. This has been attempted by Aldrich and others in the *Canons*; (see p. 65.) but inaccurately. The three ultimate Laws of Thought are the Principles of Identity, of Contradiction, and of Excluded Middle. These are directly applicable to all the syllogistic figures alike. Other general principles, but less accurate, have been given by the Port-Royal Logic, part iii. ch. 10. and by Euler, *Lettres à une Princesse d'Allemagne*, p. ii. l. 36. ed. Cournot. For a criticism of the Port-Royal principle, cf. Duval-Jouve, *Logique*, p. 306.

^b Τέλειον μὲν οὖν καλῶ συλλογισμὸν τὸν μηδενὸς ἄλλου προσδεόμενον παρὰ τὰ ἐλημμένα πρὸς τὸ φανῆναι τὸ ἀναγκαῖον, ἀτελεῆ δὲ τὸν προσ-

et *indirectos* vocant: quia per illos ad conclusionem, velut ad scopum, recta itur; per reliquos eodem perveniri potest, prius tamen alio deflectendum est.

An. Pr. I.
7. 3. 4.
I. 23. 1.

Perfici^c igitur et *revocari* atque *reduci* dicimus indirectos, cum per modum aliquem directum illationis suæ vim demonstrant. Et definitur *Reductio*^d, imperfecti Modi in perfectum mutatio,

δεόμενον ἢ ἐνὸς ἢ πλείονων, ἀ΄ ἔστι μὲν ἀναγκαῖα διὰ τῶν ὑποκειμένων ὄρων, οὐ μὴν εἰληπται διὰ προτάσεων, Anal. Pr. i. 1. 7. With Aristotle, the “dictum de omni et nullo” is the principle of all syllogism; and the conversions, &c. required by the imperfect syllogisms, must be performed before their conclusions are admitted as valid.

The *direct* and *indirect* syllogisms of the Schoolmen must not be confounded with the perfect and imperfect of Aristotle. An indirect syllogism is one in which the minor term is the *predicate*, the major the *subject* of the conclusion. See Aquinas, Opusc. xlviii. de Syll. cap. 8. Scotus, super lib. I. Anal. Prior, Quæst. xxii. sqq. Occam, Logica, p. iii. cap. 6. Of these indirect moods, five were admitted in the first figure, two in the second. (by converting the conclusions of Cesare and Camestres,) three in the third, (by converting the conclusions of Darapti, Disamis, and Datisi.) Cf. Anal. Pr. i. 7. ii. 1. Of these, the five in the first figure are the most important, being sometimes regarded as a fourth figure. See p. 75, note x. The perfect and imperfect moods of Aristotle are sometimes called *immediate* and *mediate*. Cf. Aquinas, Op. xlviii. cap. 1. Occam, Log. p. iii. cap. 2. Boethius calls them *indemonstrable* and *demonstrable*.

^c *Perfici*,—τελειοῦσθαι, ἐπιτελείσθαι; τελείωσις occurs An. Pr. i. 25. 8. *Reduci*, ἀνάγεσθαι, (never ἀπάγεσθαι:) *ostensively*, δεικτικῶς.

^d *Reductio*. The value of Reduction in Logic will depend on the principle adopted as the basis of the syllogism. In the systems of Aristotle and Kant, whose principles are immediately applicable only to the first figure, reduction is

quo necessitas illationis fiat ex inevidenti evidens. Fiet autem, quando evidenter (h. e. in prima) ostenditur conclusionem vi præmissarum vel 1. talem esse; vel 2. aliam esse non posse. Unde ^{An. Pr. I. 7. 3.} Reductio est vel *ostensiva* vel *ad impossibile**.

Utriusque praxin pro Modis nominatis docent ipsa Modorum nomina a Scholasticis in hunc finem conficta. Nam in iis tres vocales sunt totidem propositiones Syllogismi sua quantitate et qualitate signatæ. Consonæ initiales B. C. D. F.

necessary. In the system of Lambert, in which each figure rests on a separate axiom, reduction is impossible; the process being then the destruction of one distinct reasoning, and the substitution of another. By reducing the laws of thought to their simplest form, in which they are applicable to all syllogisms directly, reduction is superfluous.

* *Reductio ad impossibile*. This phrase, though sanctioned by respectable authorities, is incorrect; as may be shewn by substituting the definition. What is the meaning of "the change of an imperfect to a perfect mood to the impossible?" The error has been caused by the Aristotelian expression, ἀπαγωγή εἰς τὸ ἀδύνατον; in which, however, ἀπαγωγή does not mean reduction. The *deductio ad impossibile*, as it is usually rendered, (*abductio* would perhaps be better,) is one species of the συλλογισμὸς ἐξ ὑποθέσεως, (see Appendix, note I,) the object of which is, to prove the truth of a given problem, by inferring a falsehood from the assumption of its contradictory. This may be employed in the reduction of syllogisms, but it is also used for other purposes, as by Geometers. (Euclid. i. 7.) The correct expression is therefore *Reductio per deductionem ad impossibile*, or elliptically, *Reductio per impossibile*. The ἀπαγωγή of An. Pr. ii. 25. will be explained hereafter.

Any mood may be reduced by the *deductio ad impossibile*, though in practice it is usually confined to Baroko and Bokardo.

notant modum primæ, ad quem sit Reductio. S. P. propositionem, quam vocalis proxime antecedens designat, esse in Reductione convertendam: S simpliciter; P per accidens. M transponendas esse præmissas. K reductionem fieri per impossibile, i. e. pro præmissa, cujus symbolo adhæret, sumendam esse Conclusionis contradictoriam[†]. Quibus ex præscripto factis, colligitur in prima conclusio vel expositæ eadem, vel eam inferens, vel præmissæ contradictoria, ut in exemplo.

<i>cEs</i>	Nullum	A	est	B
<i>Ar</i>	Omne	C	est	B: <i>Ergo</i>
<i>E</i>	Nullum	C	est	A.

ad

<i>cE</i>	Nullum	B	est	A
<i>lA</i>	Omne	C	est	B: <i>Ergo</i>
<i>rEnt</i>	Nullum	C	est	A.

<i>dIs</i>	Aliquod	B	est	A
<i>Am</i>	Omne	B	est	C: <i>Ergo</i>
<i>Is</i>	Aliquod	C	est	A.

ad

<i>dA</i>	Omne	B	est	C
<i>rI</i>	Aliquod	A	est	B: <i>Ergo</i>
<i>I</i>	Aliquod	A	est	C.

[†] Whence the lines,

S vult simpliciter verti; P vero per acci:

M vult transponi; C [K] per impossibile duci.

bAr Omne A est B
Ok Aliquod C non est B: *Ergo*
O Aliquod C non est A.

ad

bAr Omne A est B
bA Omne C est A: *Ergo*
rA Omne C est B.^g

§. 7. REDUCTIONIS ostensivæ validitas sic ostenditur. Ex præmissis reducendi, per conversionem imperatam, necessario colliguntur præmissæ reducti: atque ex iis, per figuram primam, conclusio reducti: quæ vel ipsa conclusio reducendi erit, vel per illativam conversionem fiet.

Reductionis per Impossibile validitas sic ostenditur. Quoniam præmissæ ex hypothesi sunt semper veræ, ergo contradictoria præmissæ nunquam vera: ergo contradictoria conclusionis nunquam vera^h: (nam has simul veras esse demon-

^g Archbishop Whately gives an ostensive reduction of Baroko and Bokardo to Ferio and Darii, by converting the major premise by contraposition. Logic, b. ii. c. 3. §. 5. This had been done before; partly by Jung, in the *Logica Hamburgensis*, B. III. ch. 12. §. 15. and partly by Wolf, *Philosophia Rationalis*, §. 384.

^h Since a false conclusion cannot be drawn without at least one false premise, see An. Pr. ii. 2. 1. But in the present syllogism, one premise is given true, being one of those of the original syllogism; the other, therefore, is false, which is the contradictory of the original conclusion. The syllogism *ad impossibile* will not always be in Barbara; though it is so in the reduction of Baroko and Bokardo.

stratur in Barbara) ergo contradictoria conclusionis semper falsa: ergo conclusio ipsa semper vera.

[Reducitur etiam quilibet modus innominis, facto quod præcipitur, ad præmissas sui subalternantis. Tum vero conclusio, quæ colligitur in prima, erit vel expositæ subalternans, vel in expositam per accidens convertetur.

An. Pr. I.
45. 1.

Reductionesⁱ (cum primæ ad reliquas, tum earum ad se invicem) bene multas, quod et obviæ sint, et instituto meo minus necessariae, prætermitto. Illud tamen notatu dignum est, quod cum *Darii* ad *Camestres*, et *Ferio* ad *Cesare* reducatur per impossibile, uterque igitur ad *Celarent*; omnisque adeo modus reducitur ad duos universales primæ.]

An. Pr. I.
7. 5.

§. 8. PERSPICUUM est ex antedictis

I. Syllogismos simplices, certo atque necessario concludentes, fieri 24 modis: 6 in qualibet figura.

An. Pr. I.
26. 1.

II. Et in aliquo istorum modorum probari posse conclusionem quamlibet de inesse; nempe A uno modo, E quatuor, I septem, O duodecim^k. Et

ⁱ Of these reductions, it need only be observed, that they are only possible where the same problem can be proved in both figures; hence only negative syllogisms can be reduced to the second figure, and only particular syllogisms to the third. *Barbara*, *Baroko*, and *Bokardo*, cannot be ostensibly reduced to any other figure, except by the use of conversion by contraposition.

^k Rejecting the fourth figure and the subaltern moods, it will be better to say with Aristotle; A is proved only in one

rursus; in prima, conclusionem quamcunque: In ^{An. Pr. I. 4. 15.} secunda, omnes et solas negativas: In ^{An. Pr. I. 6. 16.} tertia, omnes et solas particulares: In ^{An. Pr. I. 6. 17.} quarta, quamlibet præter A. De præmissis denique, quod in prima et secunda, major semper universalis est; in prima et tertia, minor affirmativa: In secunda, præmissarum altera negativa: aliaque ejusmodi; quæ ipsa modorum nomina satis indicant¹.

Atque hinc facile colligitur, inspecto ^{An. Pr. I. 28. 1.} schemate modorum, quali medio probanda sit quæstio omnis ^{I. 82. 10.} de inesse. e. g. Quæstio A probatur in *Barbara*; medio, de quo prædicatum quæstionis universaliter affirmatur, quodque de subjecto quæstionis affirmatur itidem universaliter: et sic de cæteris.

Adverte tamen quod imperite disputantis est afferre modum innominem; ponet enim in præmissis plusquam opus est ad conclusionem. Quare et innomines hactenus sunt incensi; quamvis negari nequeant, sicubi per inscitiam adhibentur^m.

Adverte etiam, quod figura quarta tribus cæteris deterior est; cum aliis de causis, tum ex hoc præsertim, quod medium dicat de majori,

figure and one mood, E in two figures and three moods, I in two figures and four moods, O in three figures and six moods. For this reason, A is declared by Aristotle to be the most difficult proposition to establish, and the easiest to overthrow; O, the reverse. And, generally, universals are more easily overthrown, particulars more easily established.

¹ See p. 76, note y.

^m The invention of the five anonymous moods is attributed by Apuleius to Aristo of Alexandria.

hunc de minori, minorem de medio, h. e. medium nugatorie de seipso^a.

III. Syllogismis etiam adnumerantur aliæ argumentorum species; quæ nec stricte loquendo Syllogismi sunt, nec ita tamen peccant, ut propterea mereantur excludi: in quibus scilicet reticetur

^a This objection is brought against Galen by Averroes, on *Anal. Post.* I. 8. It might be better stated, *majorem nugatorie de seipso*. Reckoning backwards from the conclusion, we find that the major contains the minor, the minor the middle, the middle the major; so that, in fact, the major contains itself.

The fourth figure has been defended by Lambert, who declares it to be useful for the discovery or exclusion of the species of a genus. He frames a principle for it, called *dictum de reciproco*. I. If no M is B, no B is this or that M (Camenes). II. If C is or is not this or that B, there are B's which are or are not C. (Bramantip, Dimaris, Fesapo, Fresison.) The principle is sufficiently clumsy; the utility questionable. For the syllogism is not an instrument of discovery; and how can we *prove* the species of a genus by a particular conclusion? "Some B is C," only proves a *separable accident*. It may be observed also, that the objection which Lambert urges, and with reason, against the conversion of the second and third figures, viz. that by conversion we often substitute an unnatural and indirect for a natural and direct predication, does not hold as regards the fourth. For, in the first three moods no conversion of premises is needed. By regarding the first stated as the minor, the second as the major, we obtain a much more natural conclusion in the first figure. Fesapo and Fresison establish *exceptions*, and therefore, on Lambert's theory, should more naturally fall into the *third* figure. The whole distinction, however, between *natural* and *unnatural* predication relates to the matter, not to the form of the thought.

argumenti pars aliqua, sed quam proclive est cogitatione substituere.

1. *Enthymema*; cujus antecedens constat propositione et iudicio; nam iudicium est propositio in mente^o; e. g. *Homo est animal; ergo est vivens*. Dicitur etiam Aristoteli *Syllogismus Oratorius*; et, si integra ejus vis contineatur in unica propositione, *sententia Enthymematica*; utrumque Quintiliano *sententia cum ratione*; ut, *Mortalis cum sis, immortale ne geras odium*. Deest illi ad Syllogismum altera præmissarum; utrum vero major an minor, ex quæstione dignoscitur.

2. *Inductio*; in qua ponitur quantum opus est de singulis, et deinde assumitur de universis; ut, *Hic et ille et iste magnes trahit ferrum; ergo omnis*. Est igitur Enthymema quoddam; nempe Syllogismus in Barbara^p, cujus minor reticetur.

* *Propositio in mente*. Aldrich had in his mind the absurd etymology from *ἐν θυμῷ*, or as Versorius gives it, "ab *en* quod est in, *thymos*, quod est mens, et *monos*, quod est unum, quasi in mente retinens unam propositionem." The erroneousess of this etymology (besides its intrinsic absurdity) appears from the word *ἐνθύμημα* being found in the Greek language before it assumed a technical meaning; e. g. Soph. OE. C. 292, 1199. Some Logicians attempt to distinguish between the Logical and the Rhetorical Enthymeme, (see Sanderson, b. iii. ch. 8.) The distinction is not authorized by Aristotle, and is liable to the objection which must always lie against a wanton alteration of the meaning of technical terms. For the Enthymeme of Aristotle, see Appendix, note F.

^p The supposed minor is, of course, "All magnets are this, that, and the other." In this perversion, Aldrich has been

Anal. Pr.
II. 24. 1.
Rhet. I.
2. 19.

3. *Exemplum* ; (Aristoteli *Inductio Oratoria*⁹) ubi quod ponitur de singulari noto, assumitur de simili ignoto : ut, *Sylla et Marius laceravere rempublicam* ; ergo *Cæsar et Pompeius lacerabunt*. Hujus etiam minor reticetur ; quapropter (ut in cæteris) quæstionem *assumi* dico ; neque enim *colligitur* nisi ex posito et subintellecto.

4. *Sorites*^r ; in cujus Antecedente, ex ordinata

preceded by Zarabella, De Meth. lib. iii. cap. 3. Archbishop Whately departs still further from Aristotle, and makes Induction a Syllogism in Barbara with the *major* premise suppressed. Thus :

“ That which belongs to this, that, and the other magnets, belongs to all ;

Attracting iron belongs to this, that, and the other ;

Therefore it belongs to all.”

For the real nature of Logical Induction, see Appendix, note G.

⁹ Aldrich considers the Example as an Induction ; i. e. according to his view, as a Syllogism in Barbara with the minor premise suppressed. The supposed minor, according to this view, will be, “ Cæsar and Pompey are Sylla and Marius.” But the example proper is not a logical reasoning at all ; being a compound of an imperfect, and therefore illogical, Induction and a Syllogism. See further, Appendix, note H.

^r The Sorites is a series of propositions, in which the predicate of each is the subject of the next ; the conclusion being formed of the first subject and the last predicate. It may be expanded into a series of syllogisms in the first figure, the conclusion of each being the minor premise of the next. There will be as many syllogisms as there are intermediate propositions between the first premise and the conclusion ; the first being the only *minor* premise stated. Hence there

serie terminorum, præcedens quisque subjiçitur sequenti, donec a subjecto quæstionis pervenitur ad prædicatum, v. g. *Homo est animal: animal est vivens: vivens est substantia; ergo Homo est substantia.* In Sorite igitur subaudiuntur Syllogismi quot sunt intermediæ propositiones; (vel si mavis,

can only be one particular premise in a Sorites, the first; the others being major premises in the first figure. And the last is the only premise which may be negative: for any previous negative premise would produce a negative conclusion, which could not be used as a minor premise in the next syllogism.

The Sorites is not recognised as a distinct kind of reasoning by Aristotle. Nor is there any reason why it should have been; as it is merely a combination of ordinary syllogisms, succinctly expressed. Its distinct exposition is attributed to the Stoics. But the principle, as Melanchthon observes, is implied in Categ. 3. 1. and the Sorites itself is alluded to in Anal. Pr. i. 25. 2, 11. There is another form of the Sorites, called the *regressive* or *Goclenian*, first given by Goclenius in his *Isagoge in Organum Aristotelis*. In this, the subject of each proposition is the predicate of the next; the conclusion being formed of the last subject and the first predicate. E. g. All D is E, all C is D, all B is C, all A is B; therefore all A is E. In this, when expanded, the conclusion of each syllogism is the major premise of the next. In this Sorites, only the first premise can be negative and the last particular. This, as Krug has remarked, should really be called the *progressive*; the ordinary Sorites the *regressive*. A much more complicated theory of Sorites is given by Herbart, *Lehrbuch zur Philosophie*, §. 70. and by Drobisch, *Logik*, §. 81; but it is of little logical value.

The Sorites must not be confounded with the well-known fallacy of the same name, attributed to Eubulides of Miletus, and mentioned by Cicero, *De Divinatione*, ii. 11. In fact, the name has been loosely applied to various kinds of reasoning.

quot in antecedente termini intermedii;) unde et a cumulo nomen habet.

5. Soriti affinis est Syllogismus, cujus præmissarum altera est sententia Enthymematica^a; ut, *Nullus injustus est amandus: Omnis Tyrannus (crudelis cum sit) est injustus; ergo Nullus Tyrannus est amandus*. Qui quidem Syllogismus peculiare nomen non habet^b; præmissæ autem Enthymematicæ antecedens, Aristoteli *Prosyllogismus* est^c.

Anal. Pr.
I. 25. 11.
I. 28. 5.

6. Huc denique revocandum est compendium illud disputandi opponentibus usitatissimum, reticendi scilicet conclusionem; cum sit ipsa quæstio, quam respondens non supponitur ignorare.

[Admittuntur denique in Scholis etiam Syllogismorum formulæ, quia contra regulas voce tantum, non sensu, peccant, et mutata phrasi ad canonicas facile revocantur. Suntque nihil aliud

^a On the Enthymematic sentence, see Arist. Rhet. ii. 21. 6.

^b It is sometimes called an *epicheirema*. The word originally was synonymous with Dialectic Syllogism. See Top. viii. 11, 12. Of this *epicheirema* or *argumentatio*, the Rhetoricians enumerated various kinds, *tripartita*, *quadripartita*, *quinquepartita*, &c. See ad Heren. ii. 2. ii. 19. Cic. de Inv. i. 37 sqq. Quint. Inst. v. 13. Finally, the name *Epicheirema* was limited to the quadripartite. Cf. Trendelenburg, Elem. §. 33. For some other variations in the use of the name, see Krug, *Logik*, §. 113.

^c Not exactly. The prosyllogism, or antecedent syllogism, of Aristotle, is a syllogism employed to prove one of the premises of another syllogism. It need not be expressed in a curtailed form. See Pacius on Anal. Prior. i. 35. 3. Biese, vol. i. p. 157.

quam licentiæ quædam Syllogisticæ, et in accurata disputatione non videntur admittendæ.

1. Quando pro termino repetendo substituitur ^{Anal. Pr. I. 39.} vox illi æquipollens. Ut in hoc, *Ens naturale constans corpore organico et anima rationali est homo: Socrates est ejusmodi: ergo est homo*, et similibus. Potest enim Sophista abuti ista libertate vel ad nugandum vel ad fallendum.

2. Quando fiunt Syllogismi ex obliquis, qualis est, *Omnis hominis equus currit: Socrates est homo; ergo Socratis equus currit*. Pro minori rectius dixeris *Socratis equus est hominis equus*, alias consequentia, licet bona, non erit immediata. Atque illo insuper laborat disputatio omnis ex obliquis, quod præter necessitatem aperit locum fallaciæ.

3. Quando propositio aliqua intelligitur contra quam sonat, e. g. *Quod non habet partes non interit per dissolutionem partium: Anima humana non habet partes: ergo anima humana non interit per dissolutionem partium*. Nam major sonat negative, intelligitur vero affirmative: puta, *Quod interit &c. habet partes*. Vel etiam singulæ propositiones intelliguntur affirmative, ac si esset Syllogismus, *Omne expers est incorruptibile: Anima humana est expers; ergo anima humana est incorruptibilis*.

Eodem accenseri possunt Syllogismi quales Author *Artis cogitandi*^{*} vocat *Complexos*, in quibus

^{*} *Author Artis Cogitandi*. The work alluded to is "l'Art de penser," commonly called the Port-Royal Logic. This work has been ascribed to various authors, but was most

etiam *dijudicandis* jactat se satis imperite. v. g. p. 164. laudat hunc Syllogismum, *Lex divina jubet Reges honorari: Ludovicus XIV est Rex; ergo Lex divina jubet Ludovicum XIV honorari*. Ubi valet certe Argumentum; Syllogismus tamen est falsissimus, cum habeat quinque terminos. Nam ex conclusione patet quod major terminus est *jubet Ludovicum XIV honorari*, et minor *Lex divina*: ergo minor Propositio *Lex divina jubet Reges honorari*: ergo Medius terminus *jubet Reges honorari*: ergo Major Propositio debuit esse, *Quod jubet Reges honorari, jubet Ludovicum XIV honorari*; et tum valeret Syllogismus; nec redundarent duo termini, qui in secunda propositione jam redundant.

P. 166. Syllogismum hunc improbat *, *Debemus credere Scripturæ: Traditio non est Scriptura; ergo non debemus credere Traditioni*; quia eum scil. imperite reducit ad primam, cum tamen Syllo-

probably written by Arnauld, assisted by Nicole; the first edition was published at Paris in 1662. Aldrich has on more than one occasion spoken too slightly of this very valuable work, the *Logic par excellence* of the Cartesian Philosophy. For a better estimate of its merits, the reader is referred to Stewart's Preliminary Dissertation to the Encyclopædia Britannica, p. 80. and to the Introduction to the recent able Translation of the Port-Royal Logic, by Mr. Baynes.

* *Syllogismum hunc improbat*. In this instance, it is scarcely necessary to observe that the Port-Royal Logicians are right, and Aldrich is wrong. The premise does not *state* that *nothing but Scripture* is to be believed; and therefore the conclusion drawn is illogical.

gismus apertissime hoc dicat in secunda, *Objectum fidei divinæ est Scriptura: Traditio non est Scriptura*; ergo *Traditio non est Objectum fidei divinæ*.

Ibidem imperite autumat Syllogismum sequentem, in quo omnes propositiones videntur affirmativæ, esse in secunda; *salvari* vero, quia minor sensu exclusiva, negativam in se contineat. Quod si ipsos Syllogismi terminos rite dignoscere potuisset, vidisset sane Syllogismum esse in Barbara transpositis præmissis, v. g. *Bonus Pastor est paratus animam ponere pro ovibus; Pauci hoc sæculo sunt parati &c.* ergo *Pauci hoc sæculo sunt Boni Pastores*. Hujus conclusio perspicue dicit (non de paucis, quod sunt Boni Pastores, sed) de Bonis Pastoribus, quod sunt hoc sæculo pauci. Quare Major terminus est *hoc sæculo pauci*, et Minor *Boni Pastores*. Ergo Minor Propositio, *Boni Pastores sunt parati &c.* et Medius terminus, *parati animam ponere pro ovibus*. Syllogismus vero hic est, *Qui parati sunt animam ponere pro ovibus sunt hoc sæculo pauci: Qui sunt Boni Pastores sunt parati animam ponere pro ovibus: ergo qui sunt Boni Pastores sunt hoc sæculo pauci*¹.

¹ *Hoc sæculo pauci*. Aldrich's solution is untenable. "Few" is not predicated *distributively*, but *collectively*. From "wise men are few," we cannot infer, "Socrates is few." The syllogism, therefore, *as stated by Aldrich*, becomes a fallacy of division; though, when tested by common sense, it is unquestionably valid. The Port-Royal Logicians substitute for the minor premise, *Multi Pastores hoc sæculo non sunt parati, &c.* which is perhaps the most satisfactory way of treating the

Hæc dixisse erat operæ pretium, nequis temere repudiaret eos qui, si non videntur, sunt tamen revera Syllogismi.]

proposition, regarded as a single statement. But in fact it contains two distinct assertions; 1st, that some men are prepared; 2dly, that most men are not. The reasoning should thus be resolved into two distinct syllogisms. See Kant, *Logik*, §. 31.

CAP. IV.

De Syllogismis Hypotheticis^a.

§. 1. *Syllogismus Hypotheticus*, est in quo una, duæ, vel tres propositiones hypotheticæ. v. g. *Si sapit, est beatus : Sapit ; ergo est beatus.* Vel, *Qui sapit est beatus : Si est Philosophus, sapit ; ergo Si est Philosophus, est beatus.* Vel, *Si sapit, est beatus : Si est Philosophus, sapit ; ergo Si est Philosophus, est beatus.* Nos de eo tantum loqui instituimus qui est cæteris usitator, in quo nempe Major Hypothetica^b.

^a Hypothetical syllogisms, in the present sense of the term, are not treated of by Aristotle. An exposition of them was first sketched out by Theophrastus, which was afterwards further developed by Eudemus and the Stoics. None of these works, however, have come down to us. A few notices may be gathered from the Greek commentators; but our principal extant authority on the subject is Boethius. Of the *συλλογισμοὶ ἐξ ὑποθέσεως* of Aristotle, which Pacius has confounded, and M. St. Hilaire attempts to identify, with the hypotheticals of Theophrastus, some account will be given in the Appendix, note I. In the *Prolegomena Logica*, p. 211, I have given a theory of hypotheticals different from that commonly adopted by Logicians. But that theory, though I believe it to be more accurate than that of Aldrich, differs too widely from his text to be admissible here. I have therefore transferred it to the Appendix, note I.

^b This is the only kind of hypothetical syllogism in which the conclusion is categorical. If the minor premise, or both premises, are hypothetical, the conclusion is so too. A syllogism with all three propositions hypothetical was called by Theophrastus, *δι' ἄλλου ὑποθετικός*, (Scholia, p. 179, a. 16.)

Propositio Hypothetica late sumta definitur, Plures Categoriæ per conjunctionem aliquam unitæ, et conjunctio vocatur *Copula*; estque *Conditionalis*, *Disjunctiva*, *Causalis*° &c. ut apud Grammaticos; unde totidem Hypotheticarum species, suis copulis cognomines. Sed ad Syllogismum non faciunt, Præter *Conditionalem*, et *Disjunctivam*^d; quarum exempla, *Si sapit est beatus. Vel dies est vel nox.*

Conditionalis habet vim illativam. Unde *Conditio* ipsa, sive pars prior, quæ est instar inferentis, *Antecedens* dici solet; *Assertio*, sive pars posterior, quæ rationem habet illatæ, *Consequens*; partiumque inter se connexio, *Consequentia*°.

° *Causalis*, e. g. "Because A is B, C is D." This is, of course, only a hypothetical in the loose sense of the above definition. In the same sense were admitted *temporal* hypotheticals, "When A is B, C is D;" *locals*, "Where A is B, C is D," &c. &c. The causal hypothetical proposition is really a curtailed hypothetical syllogism. "Because A is B, C is D," is equivalent to "If A is B, C is D, and A is B." Cf. Hoffbauer, *Logik*, §. 236.

^d Nothing can be more clumsy than the employment of the word *conditional* in a specific sense, while its Greek equivalent, *hypothetical*, is used generically. In Boethius, both terms are properly used as synonymous and generic; the two species being called *conjunctivi*, *conjuncti*, or *connezi*, and *disjunctivi*, or *disjuncti*. Cf. *Edinburgh Review*, No. 115, p. 219. *Boethii Opera*, p. 610. The nomenclature of Boethius is followed by Ramus. With reference to modern usage, however, it will be better to contract the Greek word than to extend the Latin one. *Hypothetical*, in the following notes, will be used as synonymous with *conditional*.

° It has been questioned whether Hypothetical Syllogisms can be reduced to Categorical. This question must not be

Conditionalis cujusque sententia est, quod, data
Conditione, datur Assertio; quod bifariam explicari

confounded with the inquiry, whether the hypothetical *proposition* is formally the same with the categorical. The latter is answered by Kant in the negative, but that decision does not affect the present question. The reduction of hypothetical syllogisms must be governed by the same rules as that of categoricals; and in the latter case, it is allowable to substitute for a given proposition another which, though not identical, is implied by it. For instance, a particular converse is employed instead of its universal exposita. So in hypotheticals, if the new propositions contain the same terms, and are immediately deducible from the original ones, the reduction is legitimate. This will generally be the case when the hypothetical proposition has but three terms; both clauses having the same subject or the same predicate. The following instances may thus be reduced:—

- | | | | |
|---|---|------|--|
| <p>I. If All A is B, All A is C,
But All A is B;
∴ All A is C.</p> | } | to { | <p>All B is C,
All A is B;
∴ All A is C.</p> |
| <p>II. If All A is B, All C is B,
But All A is B;
∴ All C is B.</p> | } | to { | <p>All A is B,
All C is A;
∴ All C is B.</p> |

These syllogisms, indeed, were admitted by the Ramists, the great advocates of hypotheticals, to be categorical. But where the hypothetical has four terms, as, "If A is B, C is D," this mode of reduction is not practicable; yet even in this case a categorical syllogism may be constructed, whose propositions, though expressed in different terms, are implied in those of the original syllogism. Thus:

Constructive.	Destructive.
Every case of A being B, is a case of C being D.	Every case of A being B, is a case of C being D.
This is a case of A being B.	This is not a case of C being D.
∴ This is a case of C being D.	∴ This is not a case of A being B.

The above directions are all that can be given on the ordinary

potest. 1. *Si detur* Conditio, *danda est* Assertio ; unde *Regula prima* : Posita Antecedente, recte ponitur Consequens. 2. *Si daretur* Conditio, *danda esset* Assertio ; unde *Regula secunda* : Sublata Consequente, recte tollitur Antecedens.

Porro hoc unum statuit, Antecedente vera, veram esse Consequentem ; non autem ambas esse simul veras, aut simul falsas, aut una vera, falsam alteram : per illam igitur, sublata Antecedente, poni vel tolli potest Consequens ; aut posita Consequente, poni vel tolli Antecedens. Unde *Regula tertia* : Sublata Antecedente, vel Posita Consequente, nihil certo colligitur[†].

Conditionalis igitur Syllogismi duæ sunt, nec plures, formulæ.

I. Quæ vocatur *Constructiva*.

Si C. D. tum K. Δ.

Sed C. D. ergo K. Δ.

theory of hypotheticals. The first method of reduction is only approximately true ; and various ingenious examples have been framed by Logicians, to which it is inapplicable. See Krug, §. 82. Fries, §. 62. The truth is, that the so-called hypothetical proposition is really the statement of a consequence, which is sometimes formal, sometimes material ; and in the latter case, the consequence is extralogical, and cannot be reduced to any logical form, without additional assumptions derived from the matter treated of. See *Prolegomena Logica*, p. 211. Appendix, note I.

[†] By adopting the above modes of reduction, it may easily be seen, that the violation of this third rule is equivalent, in the case of denying the antecedent, to an illicit process of the major term ; in that of affirming the consequent, to an undistributed middle.

II. Quæ dicitur *Destructiva*.*

Si C. D. tum K. Δ.
Sed non K. Δ. ergo non C. D.

§. 2. QUÆ de *Conditional* dicta sunt, *Disjunctivæ* satis cavent. Ejus enim in Syllogismo positæ sententia conditionaliter efferri semper potest^b.

* The destructive syllogism is naturally reduced to the second figure in the categorical form, and cannot in most cases be brought to the first without considerable awkwardness. This may be avoided by *converting* the hypothetical before reduction. A hypothetical proposition is converted by *Contraposition*; thus, "If A is B, C is D," to, "If C is not D, A is not B." The syllogism may then be treated as a constructive. Cf. Hamilton on Reid, p. 697. Whately's Logic, b. ii. ch. 4. §. 8.

Hypothetical as well as Categorical reasonings may be combined in a Sorites. The Hypothetical Sorites consists of a series of propositions, in which the consequent of each is the antecedent of the next; the conclusion being composed of the first antecedent and the last consequent. Thus:

Constructive Sorites.

If A is B, C is D.

If C is D, E is F.

If E is F, G is H.

∴ If A is B, G is H.

Destructive Sorites.

If A is B, C is D.

If C is D, E is F.

If E is F, G is H.

∴ If G is not H, A is not B.

See Wolf, *Phil. Rat.* §. 470.

^b With regard to the import of the disjunctive proposition, Logicians are at issue. The majority (Kant among the number) regard it as stating all possible cases; so that one only of its members can be true. And Aquinas maintains that any disjunctive proposition in which this condition is not observed, is *false*. On this supposition all the four inferences given by Aldrich are valid. But it may be questioned whether the incompatibility of the members appears in the *form* of

v. g. Si posita vel C vel D

Subsumatur

Sed C ergo non D

D non C

non C ergo D

non D C

Pro exposita Disjunctiva

dic conditionaliter

every disjunctive proposition. *We may happen to know that two alternatives cannot be true together, so that the affirmation of the second necessitates the denial of the first, and the affirmation of the first the denial of the second; but this, as Boethius observes, is a material, not a formal consequence, whether it be stated in the hypothetical or disjunctive form. It must be allowed that the examples sometimes adduced on this side of the question have not been very happily chosen. It sounds oddly enough to state a known truth as a possible falsehood, as in the instance, "*Bellum Trojanum cecinit vel Homerus vel Virgilius.*" But other and more natural specimens have been given; e. g. "*Aut olim Troja fuit, aut historia de bello Trojano est mera fabula.*" The case is still clearer when both members of the disjunctive are negative, as in the example given by Boethius, "*Si enim quis dicat, aut non est album aut non est nigrum, sive album non esse assumpserit, non necesse erit esse vel non esse nigrum; sive nigrum non esse assumpserit, ut sit vel non sit album, nullam faciet necessitatem.*" On this supposition only two of the above syllogisms are valid, which may be reduced to hypotheticals as follows:*

Constructive.

If A is not B, C is D.

But A is not B.

∴ C is D.

Destructive.

If A is not B, C is D.

But C is not D.

∴ A is B.

For a further account, see Wallis, Log. Thes. 2.

Si C tum non D
D non C
non C tum D
non D C

§. 3. SUPEREST Syllogismus quidam Hypotheticus redundans, alio nomine *Dilemma*¹, quia ple-

¹ Of the word *Dilemma*, various etymologies have been proposed; 1. a choice of alternatives offered to an adversary; 2. a double premise assumed (*λήμμα*); 3. a not very probable one given by Keckermann, "a *dis λαμβάνεσθαι*, quia utrinque capit et constringit adversarium contra quem adducitur." The first seems to be adopted by Aldrich, and is perhaps supported by Cassiodorus, *Expos. in Ps.* 138, 9. "Dilemma, quod fit ex duabus propositionibus pluribusve, ex quibus quicquid electum fuerit, contrarium esse non dubium est." Cf. Victorinus in 1 *Rhet. Cic.* 86. But whatever be the origin of the word, it was certainly employed as synonymous with the *complexio* of Cicero, (*de Inv.* 1. 29.) This is expressly stated by Servius, (on *Æn.* ii. 675.) who is, I believe, the oldest extant writer in whom the word is found. In this sense it may be defined, (omitting the adversary, as belonging rather to Rhetoric or Dialectic than Logic,) "A syllogism, having a conditional major premise with more than one antecedent, and a disjunctive minor." Its different forms may be thus exhibited:

I. Simple Constructive.

If A is B, C is D; and if E is F, C is D;
But either A is B, or E is F;
∴ C is D.

II. Complex Constructive.

If A is B, C is D; and if E is F, G is H;
But either A is B, or E is F;
∴ Either C is D, or G is H.

rumque duo (etsi interdum plura) proponit adversario capienda; quorum utrumvis acceperit, causa cadet. Tale est illud Biantis, *Si uxorem ducas formosam, habebis κοινήν, communem; si deformem, ποιήν, pœnam: ergo Nulla est ducenda*^k.

¹Hoc non valet, nisi ita comparetur, ut partem alteram accipi sit necesse; utraque autem feriat; nec possit retorqueri. Quæ si vidisset Bias, suo sibi Dilemmate minus placuisset; neque enim vel formosa uxor vel deformis necessario futura est; sed est media quædam pulchritudo, quam Ennius

III. Destructive, (always Complex.)

If A is B, C is D; and if E is F, G is H;

But either C is not D, or G is not H;

∴ Either A is not B, or E is not F.

There cannot be a *simple* destructive Dilemma of this kind, as is shewn by Abp. Whately, Logic, b. ii. ch. 4. §. 5.

There is another form of reasoning, sometimes called Dilemma, which is also a hypothetico-disjunctive reasoning, but which, instead of having the major premise hypothetical and the minor disjunctive, has both combined in the major; the *whole* of the disjunctive consequents being denied in the minor. E. g. "If A is B, either C is D, or E is F; but neither C is D, nor E is F; therefore A is not B." This form is given by Wallis, lib. iii. cap. 19.; as well as by Wolf and Kant. But it is a perversion of the Dilemma proper, and introduces no distinction whatever; being merely a common disjunctive syllogism, as is shewn by Wallis himself. It is, in fact, the *enumeratio*, not the *complexio*, of Cicero.

^k See Gellius, Noct. Att. v. 11.

¹ These remarks entirely relate to the matter, and have nothing to do with the Logical character, of the Dilemma. See Whately, ii. 4. 5.

statam appellavit; Favorinus eleganter *uxoriam*. Porro, nec formosa omnis est communis, nec deformis, pœna. Denique Dilemma facile retorqueri potest. Puta, *Si formosam duxero, non habebō pœnam; si deformem, non habebō communem*. Arist. Rhet. II. 23. 15.

Dilemma nihil aliud est, quam *Inductio Negativa*^m; in qua Syllogismi Major Conditionalis est

^m This remark is taken from Wallis, and is only applicable to the Dilemma in his sense of the term. The negative induction appears categorically in this form :

There are no instances of C being D, nor of E being F.
But these are all the possible instances of A being B.
∴ There is no instance of A being B.

The Dilemma of Aldrich cannot, as it stands, be reduced to this form. The categorical conclusion, e. g. *Nulla uxor est ducenda*, does not follow from the premises of the Dilemma of Bias; but requires the additional assumption, that neither matrimonial nuisance is, under any circumstances, to be endured. This brings it to Wallis's form, thus:

*Si ducenda est uxor, aut formosa ducenda est, aut deformis:
Atqui non est ducenda formosa, neque deformis:
Ergo, Uxor non est ducenda.* (Burgersdyck, *Inst. Log.* ii. 13.)

The Complex Dilemma, as given above, may be reduced, if required, to a series of hypothetical syllogisms, and so to categoricals; thus:

Constructive.	Destructive.
If E is F, G is H;	If E is F, G is H;
If A is not B, E is F;	If C is D, G is not H;
∴ If A is not B, G is H.	∴ If C is D, E is not F.
If C is not D, A is not B;	If A is B, C is D;
∴ If C is not D, G is H.	∴ If A is B, E is not F.

The reduction of the simple Dilemma is obvious enough.

cum consequente distributiva: puta, *Si omnino, tum sic, vel sic, vel sic*; quam afferre Categorice adeo est proclive ut non indigeat præcepto.

But all such reductions, except as serving to vindicate the universality of the syllogistic model, are rather curious than useful.

CAP. V.

De Syllogismo quoad Materiam.

§. 1. HÆc de Syllogismo quoad *Formam* spectato. Jam de eodem quoad *Materiam*, h. e. *Certitudinem* et *Evidentiam* propositionum ex quibus componitur.

Certa autem propositio est, cui nihil occurrit in contrarium, vel quod occurrit instar nihili est; ut, *Omnis homo est risibilis**: *Evidens*, quæ simul

* This definition is vague enough: the example, however, shews more clearly what is intended. For *risibile* was regarded as a property, flowing from, and demonstrable by, the *differentia rationalis*. We may therefore define a *certain* proposition as "a proposition capable of demonstration." It will thus be distinguished from an *evident* proposition, which is axiomatic and indemonstrable. Both are, of course, *necessary*, which is essential to demonstrative reasoning: but the former is the conclusion of a demonstration; the latter, a premise. Waiving the physical question of the necessary connection of risibility and rationality, we may give as examples, of a certain proposition, "The angles of every triangle are equal to two right angles;" of an evident, "Things which are equal to the same are equal to each other."

Such seems clearly to be Aldrich's meaning in the present passage; in which *certa* and *evidens* correspond to what are commonly called *immediata immedietate subjecti*, and *immediata immedietate causæ*. (Cf. Sanderson, lib. 3. cap. 12. from whom this part is chiefly taken.) Aldrich's subsequent language, however, is by no means consistent.

ac percipitur assensum imperat; ut, *Totum est majus sua parte: Dubia*, in qua hæremus, cum illius pars utraque valde se probet intellectui; ut, *Astra regunt homines*; nam et regere et non regere videntur.

Dubitanti siquid aliud occurrat, quo pendens animus in alterutram partem propendeat, quod Top. I. 1. 3. erat Dubium fit *Probabile*^b. Et potest, quod probatur, *Verum* esse, sed probanti tantum *Verisimile* est. Multis nihilominus assentimur isto modo, et assensui nomen est *Opinio*^c.

An. Post.
I. 33. 2.

Est igitur *Opinio* propositionis *tantum probabilis*; eique nulla competit certitudo; sed in ipsa sui ratione includit *formidinem oppositi*. Sunt Opinioni tamen *Gradus* quidam *ad certitudinem*, pro diverso pondere rationum quæ assensum movent, Top. I. 1. 3. diversi. Est quod omnibus, quod plerisque, quod sapientibus videtur; et quod horum singulis, quod plerisque, quod celeberrimis; quorum omnium dispar est probabilitas; quorumdam vero tanta, ut ad certitudinem quam proxime accedat.

§. 2. QUI *Opinionem* (h. e. assensum quemlibet scientia minorem) parit, Syllogismus appellatur

^b Ἐνδοξα δὲ τὰ δοκοῦντα πᾶσιν ἢ τοῖς πλείστοις ἢ τοῖς σοφοῖς, καὶ νούτοις ἢ πᾶσιν ἢ τοῖς πλείστοις ἢ τοῖς μάλιστα γνωρίμοις καὶ ἐνδόξοις. Arist. Top. i. 1. 3. Such propositions form the premises of dialectical syllogisms.

^c Δείπεται δόξαν εἶναι περὶ τὸ ἀληθὲς μὲν ἢ ψεῦδος, ἐνδεχόμενον δὲ καὶ ἄλλως ἔχειν. Τοῦτο δ' ἐστὶν ὑπόληψις τῆς ἀμέσου προτάσεως καὶ μὴ ἀναγκαίας. Anal. Post. i. 33. 2.

Dialecticus, Διαλεκτικός^d, i. e. probabiliter disse- Top. I. 1. 2.
rens: quæque proprie dicitur *Dialectica*, est pars
Logicæ quæ de hoc agit Syllogismo. Multiplex
autem est materia circa quam versatur opinio, et
per omnes sparsa disciplinas: cujus infinitam pene
varietatem ad pauca capita revocavit Aristoteles,
et sub iis Effata Dialectica suis quasi in sedibus
locavit. Hæc itaque capita Τόπους, i. e. *Locos*
appellat; unde Syllogismus Dialecticus alio nomine
Topicus dicitur^e.

De Locis Dialecticis et ad ea pertinentibus
Effatis, sive (ut Scholastici vocant) Maximis^f;

^d Διαλεκτικός δὲ συλλογισμὸς ὁ ἐξ ἐνδόξων συλλογιζόμενος. Top. i. 1. 2. On the origin and different uses of Dialectic, some remarks will be found in the Introduction. Its name had originally reference, not to the probable character of the matter, but to the colloquial form.

^e The τόποι are general principles of probability, standing in the same relation to the dialectic syllogism as the axioms to the demonstrative. A definition is given, Rhet. ii. 26. 1. ἔστι γὰρ στοιχεῖον καὶ τόπος εἰς ὃ πολλὰ ἐνθυμήματα ἐμπέπτει. The origin of the name may be illustrated by calling it the *place* in which we look for middle terms; with which may be compared Cicero's definition, Top. ch. 2. "Itaque licet definire, locum esse argumenti sedem: argumentum autem, rationem, quæ rei dubiæ faciat fidem." Cf. De Orat. ii. 174. Theophrastus' definition is given by Alexander, Schol. p. 252. a. 12. ἔστι γὰρ ὁ τόπος, ὡς λέγει Θεόφραστος, ἀρχὴ τις ἢ στοιχεῖον, ἀφ' οὗ λαμβάνομεν τὰς περὶ ἕκαστον ἀρχάς.

^f The Schoolmen divided *Locis* into two kinds, which they called *Maximæ*, and *Differentiæ Maximarum*. The former were propositions expressing a general principle of probability, (or even of certainty, for the term was extended to include axioms;) such as, "De quocunque prædicatur definitio, et definitum."

Top. III.
1. 2.

plura non loquor. Pro exemplo tamen hoc accipe: Inter Maximas Loci primi, qui est *Testimonium*, reperitur hæc; *Peritis credendum est in sua arte*: ex qua elicitur hujusmodi Syllogismus Topicus. *Quod* (Pythagoras) *Ipse dixit concedendum est*: *Migrare animas Ipse dixit*; ergo *Migrare animas concedendum est*. Probatur Major; quia *Peritis credendum est in sua arte*.

§. 3. *CERTITUDO* eadem videtur, quæ improprie vulgo dicitur *Evidentia Moralis*⁶; quæque iis con-

The latter consisted of one or more words, expressing the point in which one maxim differed from another; e. g. the above maxim was said to be *ex definitione et definito*: so in Aldrich's example the maxim is, *Peritis credendum est in sua arte*; the differentia, *Testimonium*. The latter were sometimes called simply *Loci*. Cf. Petr. Hisp. Tract. v. The distinction is not warranted by Aristotle, with whom the *τότοι* are always Propositions.

The history of the word Maxim is given in a learned note by Sir W. Hamilton, Reid's Works, p. 766. He shews that it originated with Boethius, by whom, however, it was merely used as an adjective, in the phrase *maxima propositio*. The Schoolmen dropped the latter word, and employed *maxima* as a substantive.

⁶ This paragraph, Aldrich appears to have taken from the Cartesians, and spoiled in the taking. Thus Clauberg, *Logica*, P. I. qu. 133. "Quænam axiomata minimum habent veritatis seu certitudinis? *Contingentia* seu contingenter vera, h. e. quæ ita vera sunt ut falsa esse possint: ut si judicem matres amare liberos suos. Horum axiomatum certitudo vocatur vulgo *Moralis*, non quod in rebus tantum ethicis seu moralibus locum habeat, sed quod aliter de talibus statuendo contra bonos mores plerumque peccetur." And in the same manner,

venit effatis, de quibus nemo prudens dubitaverit : qualia præsertim sunt *Principia* ad vitam moresque pertinentia, cum conclusionibus quæ ab his legitime deducuntur. Nam hujusmodi propositiones videntur esse plusquam probabiles, nondum tamen evidentes : neque enim eas quisque amplectitur quamprimum apprehendit ; sed iis prudens sine ulla formidine assentitur.

Certitudo^h duplex est ; alia *Objecti*, quæ est rei

moral certainty is distinguished from *metaphysical* by Descartes. *Méthode*, p. iv. This is obviously a totally different sense of the word *certainty* from that given at the beginning of the chapter. "Omnis homo est risibilis" can hardly by any stretch of language be called a moral precept. Moral certainty is a very different thing from demonstrative certainty, being merely a high degree of probability. But nothing can be more confused than the whole of this chapter.

^h We have now got back again to demonstrative certainty. This part is taken from Sanderson, whose account is infinitely clearer than that of Aldrich. "Demonstratio est *Syllogismus faciens scire*. Scire autem unumquodque dicimur, cum causam cognoscimus propter quam res est, quod illius rei causa sit, nec possit res aliter se habere. Unde duplex oritur scientiæ certitudo : altera objecti, vel *scibilis*, quando rei causa proxima apprehenditur : altera subjecti, vel *scientis*, quando sciens certus est rem non posse aliter se habere. Per illam distinguitur *scientia* ab *errore* : per hanc ab *opinionibus*, quæ includit in ratione sui formidinem oppositi." From the above account it is clear that there can be no degrees of either Certainty. For any obstacle as regards the object, renders the proposition no longer certain, but doubtful ; any consciousness of such in the subject, reduces the state of mind from knowledge to opinion. The same may be said of Evidence, in the proper limitation of the term. A proposition not *sponte perspicuum* may be certain, but is not evident.

percipiendæ; alia *Subjecti*, quæ est Intellectûs percipientisⁱ. Et utrique sui sunt *gradus*. Est enim *Certius* certitudine Objecti, id cui minus obest; certitudine Subjecti, cui quod obsit minus percipitur. Evidentia similiter duplex est; *Objecti* nempe, et *Subjecti*; et utrique sui sunt *gradus*. Dispar enim evidentia est, prout id quod percipitur vel est sponte perspicuum; vel a sponte perspicuo propius abest; vel utrumvis horum videtur.

Atque hinc, rursus, *Evidentia*^k multifariam divi-

ⁱ On the history of the terms *Object* and *Subject*, *Objective* and *Subjective*, see Sir W. Hamilton's note, *Reid's Works*, p. 806. and Trendelenburg, *Elementa*, §. 1. The variations between the scholastic and the modern sense of these terms are however in this particular relation unimportant. Where *knowledge* or *certainty* is spoken of, the subject of inherence (in the scholastic sense) is the mind as knowing; and the object proper is the thing as known; and thus far, the modern use of the same terms is nearly coincident; though when viewed out of relation to the act of knowledge, the two nomenclatures are exactly the reverse of each other. In our present point of view we may distinguish *certitudo objecti* as a *quality of the proposition as apprehended by the mind*, and *certitudo subjecti* as a *state of the mind as apprehending the proposition*; and in this sense the two are inseparable from each other, being only the same act of thought viewed from opposite sides. This is the only sense of *object* and *subject* with which Logic has any concern. The *subjective existence*, as the schoolmen would call it, or the *objective existence*, as the moderns would call it, of things out of the act of thought, belongs to a metaphysical inquiry, with which, as logicians, we have no concern.

^k Evidence is here extended so as to include not only axiomatic but demonstrated propositions. This licence

ditur. Sed nostro sufficit instituto, quod hæc, de quæ loquimur, Propositionis *Evidentia*, vel est 1. *Axiomatis* sponte perspicui; cui proinde sine ulla probatione assentimur: vel 2. *Conclusionis* ab ejusmodi axiomatibus (*immediate* an *mediate* parum refert, modo) rite deductæ. Nam cum una sit Veritas, sibi constans, apteque cohærens; quodque verum, vel per se certum atque evidens sit, vel cum effatis quibusdam certis et evidentibus necessario connexum; fit, ut quamprimum apprehenditur hæc connexio, eadem omnia quasi luce perfusa, parem (specie) consequantur assensum.

§. 4. Qui postremæ huic evidentiaæ competit assensus apud Logicos vocatur *Scientia*. Est igitur An. Post. I. 2. 2. I. 4. 1. *Scientia conclusionis certæ et evidētis*, a præmissis certis et evidentibus legitime deductæ¹. Certitudinem vero utramque intelligo; et utramque (tam Objecti scilicet quam Subjecti) evidentiam. Nam per Objecti certitudinem *Scientia* distinguitur ab An. Post. I. 33. *Errore*; per Subjecti certitudinem ab *Opinione*^m.

Aldrich perhaps took from Crakanthorpe, who uses *certain* and *evident* as synonymous terms; but he departs from his principal authority, Sanderson, and is inconsistent with himself. *Evident* should be limited to the axioms, the original premises of demonstration; *certain*, to the conclusion.

¹ It would be better to say, "conclusionis certæ, a præmissis certis vel evidentibus." The premises in demonstration may be axiomatic principles, or the conclusions of previous demonstrations. In both cases the result is *scientia*, though in the latter the demonstration is not *potissima*.

^m Strictly speaking, objective and subjective certainty of

Si desit evidentia subjecti, nulla est *Scientia*; ubi sola adest, *persuasa* tantum, non *realis* evidentia est.

An. Post.
I. 2. 2.
I. 4. 1.
Top. I. 1. 2.

Qui *Scientiam* parit Syllogismus appellatur *Scientificus*; alio nomine, Ἀποδεικτικός *Demonstrativus*, et interdum *Demonstratio*. Conclusiones enim certas et evidentes apud Mathematicos reperiri multas in confesso est: cumque Illi, quæ

thought cannot be actually separated from each other, being merely the same act of thought viewed from opposite sides. Of objects out of the act of thought, the thinker knows nothing. But in comparing two minds together, one of whom is supposed to have a firm conviction of a true proposition on sufficient grounds, the other an equally firm conviction of a false proposition, the difference between them will lie, not in the state of conviction which is common to both, but in the object on which it is exercised; and the change from error to knowledge will be effected by the substitution of one object for another. On the other hand, if a truth known scientifically by one man is assented to with hesitation by another, the difference lies in their respective states of mind in relation to a common object, and the change from opinion to knowledge will consist in a different mode of contemplating the same truth. Hence, in strict accuracy, we should say, that the characteristic of error is the attribution of certainty to a wrong object; that of opinion, the absence of certainty in the subject. The criterion of knowledge from error is strictly the character of the object as it appears to a rightly informed mind; and hence, among the later logicians, we find *respectu objecti* used as equivalent to *per se*; and opposed to *respectu subjecti*, as it appears to this particular thinker. This forms the connecting link between the scholastic use of *objective* to denote what exists only in thought, and the modern use, to denote the absolute affections of things without the mind.

docent, soleant adjuncto *Diagrammate* ostendere; seque propterea non rem probare, sed (quod majorem innuit Evidentiam) *Demonstrare* dicant; arcesso igitur ab illis vocabulo, *Syllogismus scire faciens* apud Logicos vocatur *Demonstratio*. Cumque in Scientia (siqua forte possibilitas, tamen) nullus sit erroris metus; quod hujusmodi Syllogismis, sive uno, sive pluribus probatur, id libenter agnoscimus sicut perhibetur *ita esse*; et *aliter* (saltem naturaliter) *se habere non posse*.

§. 5. DUE sunt Demonstrationis species. Prima, quæ demonstrat *Ὅτι*, sive *Quod res sit*; probando, vel simpliciter et directe *rem ita esse*, et tum vocatur *Ostensiva*, seu potius *Directa*; vel si *non sit*, absurdi aliquid necessario secuturum. Hæc est quæ Græce dicitur *Ἀπαγωγή*, Latine, *ducens*

Anal. Pr.
II. 11. 1.
An. Post.
I. 26. 1.

^a *ἀπαγωγή ducens ad impossibile*. This is only a correct rendering of the Aristotelian *ἀπαγωγή εἰς τὸ ἀδύνατον*: see p. 85. note e. The term *ἀπαγωγή*, when it occurs by itself, has a different meaning. It is a syllogism whose major premise is certain, and its minor either more probable or more easily demonstrable than the conclusion. It thus holds an intermediate place between the demonstrative and the dialectic syllogism. See Anal. Pr. ii. 25.

The connecting notion between these two senses of *ἀπαγωγή* seems to be that of a *change of question*; a *turning off* from the immediate point to be proved to something else on which it may be made to depend. Thus, in the *deductio ad impossibile*, instead of proving the original question directly, we attempt to shew the falsehood of its contradictory; and in the present case we abandon the immediate proof of the conclusion for that of the minor premise on which it depends.

ad absurdum, impossibile, incommodum, uno verbo recte dixeris *Obliquam*. Exemplum ejus dat reductio Syllogismi a *Baroko* vel *Bokardo* ad *Barbara*.

Ostensiva Directa fit duobus modis.

An. Post. I. 13. 1, 2. 1. Quando aliquid demonstratur per *Effectum*;

ut si diceret, *Luna Soli opposita nigra cernitur*;

An. Post. I. 13. 1, 5. ergo *patitur Eclipsin*. 2. Quando per *Causam*

remotam; ut si idem colligeres quia *Sol et Luna diametraliter opponuntur*. Quod si illud demonstrares per *Causam proximam*, quia nempe *Terra inter Solem et Lunam interponitur*, tum fieret

An. Post. I. 13. 3. Secunda Demonstrationis species *Διότι*, i. e. quæ

II. 16. 4, 6. docet *Quare*, vel *Propter quid* res sit; causam

II. 17. 3. ejus assignando, non quamcunque, sed *proximam* seu *immediatam*°. Sic enim statuunt Logici quod

° *Immediatam*. The word *ἀμεσος* is used in two senses by Aristotle. 1. For a proposition not proved by any *higher* middle term; i. e. an axiomatic principle, forming the first premise of a demonstration. Such is the sense in Anal. Post. i. 2. 2. and ii. 19. 1. 2. For a premise immediate as regards its conclusion; i. e. not requiring the insertion of *lower* middle terms to connect its terms with those of the conclusion. Such is the sense in An. Post. i. 13. 1. This second sense is intended here.

Of an immediate proposition in the first sense, the favourite scholastic example was, *Omne animal rationale est risibile*; the predicate being regarded as flowing directly from the subject, not as connected with it by any intervening cause. Whereas in *homo est risibilis*, between predicate and subject intervenes the middle term *rationalis*. See Aquinas, Opusc. 48. de Syll. Demon. cap. 5. Zabarella, in I. Anal. Post. c. 2.

Scientia omnis est *Cognitio rei per causam*, sed *proprie dicta* per *propriam*, h. e. *proximam*: nam per remotam *Cur sit* aliquatenus ostenditur; nihil amplius quam *Quod sit* demonstratur.

Utriusque Speciei membra gradu differunt. Nam obliqua *ὅτι* est deterior directa, quia non demonstrat *rem ita esse*, nisi quatenus docet *eam aliter se habere non posse*; quod tametsi eodem redeat, tamen animo minus satisfacit; nam si par sit utrobique Certitudo, hujus tamen minor Evidentia est ^P.

Habet et *Διότι* suos gradus; quia potest esse causa proxima quæ non est *prima*, h. e. per se nota et indemonstrabilis: cujus ideo præfertur Evidentia, quia (contra quam cæteræ) sua luce est conspicua, et nihil indiget aliena. Quare, quæ

An. Post.
II. 18.

cont. 9. Hence the following specimen of a *demonstratio potissima*:

Omne animal rationale est risibile;
Omnis homo est animal rationale; ergo
Omnis homo est risibilis.

Any subsequent demonstration from this conclusion; e. g. *Omnis Philosophus est homo; ergo Omnis Philosophus est risibilis*; would be *per causam proximam, sed non primam*. Whether this distinction can fairly be traced to Aristotle is questionable. Some further remarks will be found, Appendix, note K.

^P Here we have a third meaning of *evidentia*. It is now, not the evidentness of a *Proposition*, but that of a *Demonstration*; i. e. the clearness of connection between premises and conclusion.

CAP. VI.

De Methodo^a.

§. 1. METHODUS est talis dispositio partium aliqujus disciplinæ, ut integra facilius discatur^b.

^a Μέθοδος in Aristotle is employed with various shades of meaning; 1. for any instrument of acquiring or communicating knowledge; as in de An. i. 1. 4. *πότερον ἀπόδειξις τις ἐστὶν ἢ διαίρεσις ἢ καὶ τις ἄλλη μέθοδος*. Cf. Philoponus, Scholia, p. 235, a. 10. 2. for knowledge reduced to system; and thus as equivalent to ἐπιστήμη: Phys. Ausc. i. 1. 1. Eth. Nic. i. 1. 1. Top. i. 2. 2. 3. for a systematic treatise on any branch of knowledge, synonymous with πραγματεία: Polit. iv. 2. 1. vi. 2. 6. Eth. Nic. i. 2. 9. But method, in the present sense of *arrangement*, is not treated of in the logical writings of Aristotle, with the exception of a few rules for the arrangement (τάξις) of a dialectical disputation in the eighth book of the Topics. A lost treatise, called *Methodica*, is mentioned in the Rhetoric, I. 2. Method, as a distinct part of Logic, was first introduced by Ramus, and from him passed to the logical writings of the Cartesians and of Gassendi, by whom it was treated as a fourth part of Logic. Like most of the additions to the Aristotelian system, it was originally the property of the Rhetoricians.

^b Method has been treated of by Logicians in two principal senses. 1. As a process of inference from the known to the unknown; which is the earlier sense of the term, and sanctioned by Aristotle and his Greek interpreters. 2. As an arrangement of truths already known, with a view of communicating them to others. The last corresponds to the Greek τάξις, and should rather be called *Ordo*. It is distinguished from the first by Zabarella and others. Aldrich's definition corresponds only to the second sense of *Methodus*; but in his subsequent division he confounds it with the first.

Eth. Nic. I. 2. 5. Phys. Ausc. I. 1. 1. Estque duplex. 1. *Inventionis*, quæ disciplinæ præcepta invenit; 2. *Doctrinæ*, quæ tradit. Prior procedit a sensibilibus, et singularibus, quæ sunt *nobis notiora*, ad intelligibilia, et universalia quæ sunt *notiora naturæ*; posterior, contra^c.

Method in either sense is not properly a part of Pure or Formal Logic. It is an application of Logic to the discovery or communication of truths in material science: its rules cannot be determined *à priori* from the laws of thought; but must be gathered empirically from the examination of particular sciences, and will require modification in many instances from the particular matter with which they have to deal.

^c The *Methodus Inventionis* can only be a process of inference: for no *arrangement* of parts is possible before they have been discovered. The *discovery* of general principles from individual objects of sense, if limited to the inferential process itself, will be *Induction*. The term, however, is sometimes extended so as to include the preliminary accumulation of individuals. In this wider sense it will embrace the four successive steps given by Aristotle, Anal. Post. ii. 19. αἰσθησις, μνήμη, ἐμπειρία, ἐπαγωγή.

But the *Methodus Inventionis* must not be absolutely limited to Induction and its preliminaries, though these are the most important instruments of discovery. In some sciences, as in mathematics, truths are chiefly discovered by demonstration; and till so discovered, cannot, of course, be imparted to others by the *methodus doctrinæ*.

Induction and Syllogism are the only two methods of *inference*. The Greek commentators, Ammonius and Eustratius, enumerate four, adding Division and Definition; but in these last there is no reasoning process. See Zabarella, de Methodis, lib. iii. cap. 5 sqq. If we extend the method of discovery beyond the process of inference proper, so as to include any accumulation of knowledge, we may distinguish three principal instruments. 1. Pure experience, applicable to

Methodus Doctrinæ duplex est. ^a*Perfecta*, ἀκροαματική; et *Imperfecta*, ἐξωρετική. Perfecta rursus, vel *Universalis* est, qua integra disciplina, vel *Particularis*, qua aliqua disciplinæ pars docetur. Utraque duplex est.

1. *Compositoria* sive *Synthetica**, quæ inservit

An. Post.
I. 7. 1.
I. 10. 4.
Eth. Nic.
I. 2. 5.

the acquisition of historical knowledge. 2. Demonstration, applicable to sciences of pure reasoning. 3. Induction, applicable to mixed sciences of reasoning and fact. Cf. Fries, *System der Logik*, §. 117.

^a The *Methodus Doctrinæ* is not in the same sense a process of inference from known to unknown; for the parts are supposed to be known already to the teacher, and are methodically arranged for the benefit of the learner. This then corresponds rather to Order than to Method in the proper sense. It may be an arrangement either of the whole or of a portion of a subject; and is thus either universal or particular. Cf. Zabarella, de Methodis, lib. ii. cap. 20. The distinction between the Perfect and Imperfect Method is not usually recognised by writers on the subject. Aldrich is thinking of the *acroamatic* and *exoteric* teaching of Aristotle and others; the characteristic feature of the latter being the suppression of certain doctrines as not fitted for a promiscuous audience. Whereas the universal and particular Methods merely relate to the whole and the parts in the same exposition.

* On Synthesis and Analysis, and the various employment of both, some remarks will be found in the Appendix, note G. The notion of Synthesis in the present passage corresponds to that of Metaphysical parts and whole, which is there mentioned as applicable to a syllogistic process from a general principle to its particular applications. Not so that of Analysis; which in the present passage is also a process from the universal to the particular, not from the particular to the universal. By *Subjectum* is meant the most general Subject whose properties the Science investigates; as Magnitude in Geometry.

disciplinis Theoreticis; et a notione *Subjecti* incipiens, principia ejus et species investigat, donec a summo genere in ista disciplina perveniat ad infimam speciem[†]. 2. *Resolutoria* sive *Analytica*[‡], quæ inservit disciplinis Practicis; et

Eth. Nic.
VI. 13. 10.
VII. 9. 4.
Metaph.
VI. 7. 6.

The *Principia* are the ἀρχαὶ ἐξ ὧν, or axiomatic principles, from which the demonstration commences. *Species* are the subdivisions of the general Subject; as the square, the triangle, &c. Cf. Anal. Post. i. 10. 4. Πᾶσα γὰρ ἀποδεικτικὴ ἐπιστήμη περὶ τρία ἐστίν, ὅσα τε εἶναι τίθεται (ταῦτα δ' ἐστὶ τὸ γένος, οὐ τῶν καθ' αὐτὰ παθημάτων ἐστὶ θεωρητικὴ) καὶ τὰ κοινὰ λεγόμενα ἀξιώματα, ἐξ ὧν πρώτων ἀποδείκνυσσι, καὶ τρίτον τὰ πάθη, ὧν τί σημαίνει ἕκαστον λαμβάνει. On the position of these in demonstration, some remarks will be found in Appendix, notes C and K: see also Trendelenburg, Erläuterungen, p. 118.

[†] “Exemplum evidens in primis est in scientia physica, ubi primum tractatur de corpore naturali in genere, deque affectionibus ejus et principiis; post descenditur ad species corporis naturalis, videlicet corpus simplex, cælum, elementum; post mixtum, idque iterum vel imperfecte mixtum, vel meteora; post perfecte mixtum, idque iterum vel inanimatum, ut metalla, mineralia, vel animatum, idque vel vegetans, ut planta, vel sentiens: idque iterum vel irrationale, ubi tractantur omnia animalia bruta: vel rationale, ut homo; atque ita a summo genere ad species infimas devenitur. Eadem methodus observatur in mathematica et physica.” Keckermann, Syst. Log. lib. iii. Tract. ii. cap. 1. Cf. Zabarella, de Meth. lib. ii. cap. 7.

[‡] The Analytic, as well as the Synthetic Method, observes a deductive order from premises to conclusion. Its name then refers, not to the metaphysical relations of Species and Genus as whole and part, but to that common illustration of Aristotle's, by which, in productive or practical operation, the product or end is represented as a whole, and the materials or means as parts. The order of teaching will be the same as that of deliberation; the reverse of that of operation. The following

a notione *Finis* incipiens, subjectum, et tandem media investigat^h.

Regulæ Methodi generales hæ sunt. In tradenda disciplina 1. Nihil desit aut redundet. 2. Singulæ partes inter se consentiant. 3. Nihil tractetur quod non sit subjecto aut fini homogeneum. 4. Singulæ partes aptis transitionibus connectantur.

passages may illustrate the image. Eth. Nic. iii. 5. 11. ἀλλὰ θέμενοι τέλος τι, πῶς καὶ διὰ τίνων ἔσται σκοποῦσι, καὶ διὰ πλειόνων μὲν φαινομένου γίνεσθαι διὰ τίνος ῥᾶστα καὶ κάλλιστα ἐπισκοποῦσι, δι' ἑνὸς δ' ἐπιτελουμένου πῶς διὰ τούτου ἔσται κάκεινο διὰ τίνος, ἕως ἂν ἔλθωσιν ἐπὶ τὸ πρῶτον αἷτιον, ὃ ἐν τῇ εὐρέσει ἔσχατόν ἐστιν· ὁ γὰρ βουλευόμενος ἔοικε ζητεῖν καὶ ἀναλύειν ὥσπερ διάγραμμα . . . καὶ τὸ ἔσχατον ἐν τῇ ἀναλύσει πρῶτον ἐν τῇ γενέσει. Eth. Nic. vi. 13. 10. οἱ γὰρ συλλογισμοὶ τῶν πρακτῶν ἀρχὴν ἔχοντές εἰσιν, ἐπειδὴ τοιόνδε τὸ τέλος καὶ τὸ ἀριστον. vii. 9. 4. ἐν δὲ ταῖς πράξεσι τὸ οὐ ἕνεκα ἀρχὴ ὥσπερ ἐν τοῖς μαθηματικοῖς αἱ ὑποθέσεις. An example of the deliberative and practical processes will be found, Metaph. vi. 7. 7.

By *subjectum* is meant the *subjectum operationis*, or *materia circa quam*, more properly called the *object*; by *media*, the means by which out of this matter the end is produced. In building, e. g. the house is the *end*; the materials the *subject*; the act of building, *the means*. In Ethics, as treated by Aristotle, happiness is the *end*; man the *subject*; virtue the *means*.

^h Exemplum evidens methodi analyticæ ab Aristotele in Ethicis proponitur, ubi libro primo *finis* præcognoscitur, scilicet felicitas; post *subjectum*, nimirum hominis appetitus, seu voluntas, et intellectus; sequentibus libris *media* traduntur, per quæ finis introducitur, videlicet virtutes theoreticæ et practicæ." Keckermann, Syst. Log. lib. iii. tr. 2. cap. 1.

5. Præcedat in docendo, sine quo alterum intelligi non potest, ipsum vero sine altero potest.

§. 2. IN tradendis disciplinis suis Mathematici hac utuntur methodo. 1. *Vocum significationem* constituunt: h. e. *Vocabula artis* suo quodque loco sic definiunt, ut legem sibi statuant iis nusquam uti, præterquam in eo sensu quem explicat definitio. 2. Definitionibus subjungunt *Axiomata*, quas et *κοινὰς ἐννοίας* vocantⁱ; h. e. effata sponte perspicua, quibus in decursu operis utendum vident. 3. Posthæc adjiciunt *Postulata*, quæ ad praxin spectant; suntque per se certa et evidentia; quæ proinde sine probatione concedi suo jure *postulant*. 4. Hisce positis, propositiones demonstrant; ordine, et, quoad fieri potest, affirmate: una lege contenti, ut, quicquid demonstratum eunt, ex ante datis vel probatis manifestum faciant. Cætera, in quibus methodi præceptores multi sunt et odiosi, non morantur.

Mathematicorum methodum in cæteris artibus et scientiis, si tenere non liceat, æmulari certe

ⁱ The *κοινὰς ἐννοίας* of the mathematicians correspond to the *ἀξιώματα* of Aristotle. The latter term is not used by Euclid; nor by any of the early Mathematicians in its Aristotelian sense. Among the Stoics, axiom was synonymous with proposition, and in this sense it is mentioned in a passage of Apuleius, quoted p. 43, note a. For a full history of the term and its several uses, see Sir W. Hamilton's note, Reid's Works, p. 764.

licet. Quo ad hanc quæque proprius accedit, eo cæteris perfectior, et ad docendum aptior videtur. Sed ad ea quæ docentur retinenda, nihil est utilius absoluti operis conspectu; in quo, ea quæ sunt ante (extra ordinem fortasse) demonstrata, suis quæque in locis, h. e. servata Logicorum methodo, reponantur.



APPENDIX.

Solutio Sophismatum^a.

§. 1. Cujuscunque Syllogismi difficultas ad duas Species revocari poterit; alteram, quæ in *Argumenti Materia*, alteram, quæ in *Forma* consistit: nam qui has duas expedire noverit, is in tertia, quæ ex ambarum complexione oritur, non hærebit.

^a The examination of Fallacies is extralogical, except when the consequence is formally invalid; in which case it may be detected by the ordinary rules of syllogism. The following Sophisms are not all susceptible of this solution. They are mostly material fallacies, arising from ambiguity of language or falsity of assertion. But they are not treated of by Aristotle as belonging to the Science of Logic, but to the Art of Dialectic, of which, as has been before observed, a considerable portion is material. In fact, Aristotle's Treatise *περί σοφιστικῶν δόγμων* is merely an account of the pseudo-refutations principally in use among the Sophists of his day, whether depending upon equivocal language, false assumption, or illogical reasoning. In relation to Logic, it has little more than a historical value. A strictly logical classification of fallacies should commence by distinguishing, in all the three operations of thought, between the *matter* which is given *to*, and the *form* which is given *by* the thinking act. Acts of conception, judgment, or reasoning which violate the laws of thought, and are therefore defective in form, should be classed as logical fallacies; those which are faulty in the conditions preliminary to the act of thought should be classed as material. See further, *Prolegomena Logica*, p. 237.

Soph.
Elench.
9. 1.

Si inciderit *Materia* difficilis, unicum huic malo remedium est, disciplinam unde desumitur argumentum, fideliter didicisse: quod ut facias, *Instrumenti* operam tibi Logica præstabit; sed ulterius nihil confert. Proprium illi munus est Syllogismi Formam explorare; h. e. Utrum Conclusio ex Præmissis consequatur propter ipsum Colligendi modum: Sed an ponendæ sint Præmissæ (nisi forte sint pure Logicæ) aliunde descendum est. Sicubi autem Syllogismus qui legitimus non est, videatur tamen; aut contra; (quorum utrumque sæpissime, et de causis pene infinitis accidit) Formalem ejus Consequentiam excutere est Artis Logicæ.

An. Pr. I.
32. 8.

Qui hoc opus aggreditur, id sibi negotii datum sciat, ut Difficilem suum Syllogismum, primo in Categoricalum purum, vel in plures, si opus sit, convertat; tum ad Canonem accurate exigat; cujus operis ratio præcedente Libro abunde declarata est. Summa rei huc redit. Consideranda est primo Conclusio; ejusque Termini solerter distinguendi: Prædicatum enim est Major Terminus Syllogismi; qui proinde Præmissam quoque Majorem indicabit; Subjectum pariter Minorem; et in utraque sese offeret Argumentum sive Terminus Medius: Unde et si desit Præmissarum alterutra, facile suppleri poterit. Hisce cognitis, nec Figura Syllogismi, nec Modus latebit; qui si legitime, nec tamen vere concludere videatur, quærendum annon anceps sit aliquis trium Terminorum? nam si in iis

nulla lateat ambiguitas, necessario falsa erit altera Præmissarum.

Hunc in modum licebit Syllogismum quemvis Categoricalum purum explorare; qualis si non sit qui proponitur, quam facillime fiet, per ea quæ priore Libro, extremo Capite tertio, et toto quarto sunt ostensa. Siquid amplius restet, id Exemplis melius quam Præceptis docebitur.

§. 2. ORDIEMUR autem a facillimis; nempe veterum Sophistarum *Fallaciis*; quarum 13 species ^{Soph. Elench. 4. 1.} enumerat Aristoteles; sex, quæ *multiplicitate dictionis*; septem, quæ aliquo *extra dictionem* vitio laborarent^b. Et erat aliqua fortasse difficultas in

^b Of the Aristotelian division of Fallacies into *οἱ παρὰ τὴν λέξιν* and *οἱ ἔξω τῆς λέξεως*, Archbishop Whately observes, that it has not hitherto been grounded on any distinct principle: he therefore adopts a conjectural explanation, according to which the former are interpreted as logical Fallacies, in which the conclusion does not follow from the premises; the latter, as material Fallacies, where the conclusion does follow, the falsehood being in the assumption. This, however, is not the ancient principle of distinction, which is stated, with more or less clearness, by several Logicians. To go no higher than Sanderson; we find, "Fallacia omnis in dictione oritur ex dictionis aliqua multiplicitate. Est autem Multiplex aliud actuale: quando dictio invariata multa significat; ut in *equivocatione*, et *amphibolia*. Aliud potentiale: quando dictio quoad prolationem aliquo modo variata, multa significat; ut in *compositione*, *divisione*, et *accentu*. Aliud phantasticum: quando dictio unum reipsa significans, videtur tamen multa significare; ut in *figura dictionis*. Fallaciæ extra dictionem sunt in quibus contingit deceptio, non tam ex multiplici aliquo latente in vocibus ipsis, quam ex ignoratione rerum."

earum aliquibus, juxta veterem disputandi (h. e. interrogandi) morem propositis; sed profecto nemo tam obtusus est, qui non easdem Syllogistice propositas agnoscat statim, et derideat. V. g. Erit fortasse qui rogatus *Quod non amiserit utrum habeat necne?* non intelligat se captum iri, sive simpliciter habere se, sive non habere responderit: at proposito hujusmodi Syllogismo, *Quod non amisisti habes; Cornua non amisisti; Ergo habes: Vel Quod non amisisti non habes; Oculos non amisisti; Ergo non habes;* quid reponat nemo non videt.

This principle is found in Alexander of Aphrodisias, Scholia, p. 298, b. 28.; and still earlier, if the work be genuine, in the Treatise *περὶ τῶν παρὰ τὴν λέξιν σοφισμάτων*, ascribed to Galen. Indeed it may be gathered from Aristotle himself; Soph. Elench. 4, 1. 6, 2. 7, 3. Occam states the distinction still more clearly. "Fallaciæ in dictione sunt illæ penes quas secundum omnes modos peccant sophistica argumenta composita ex signis voluntarie institutis. Fallaciæ extra dictionem sunt illæ pene quas peccant argumenta tam composita ex signis voluntarie institutis quam composita ex signis naturaliter significantibus." Logica, iii. 4. cap. 1. The former arise from defects in the arbitrary signs of thought, and hence are generally confined to a single language, and disappear on being translated into another. The latter are in the thought itself, whether materially, in the false application of notions to things, or formally, in the violation of the laws by which the operations of the reason should be governed; and thus adhere to the thought, in whatever language it may be expressed. Under this head are thus included both false judgments and illogical reasonings. These Fallacies are connected with language only secondarily and accidentally; the former primarily and essentially. See further, Waitz, vol. ii. p. 532.

Fallaciæ *dictionis*, sive *in dictione*, sex sunt^c.

§. 3. 1. FALLACIA *æquivocationis*, sive nata ex voce æquivoca: ut, *Canis est animal; Sirius est canis*; Ergo, *Sirius est animal*. In hoc quatuor sunt termini; quorum duo, vox *Canis* æquivoce sumpta.

2. Fallacia *amphiboliæ*; sive nata ex sententia *amphibola*, h. e. ancipitis structuræ; ut *Quod tangitur a Socrate illud sentit; Columna tangitur a Socrate*; Ergo *Columna sentit*. Vox *sentit*, non sponte, sed in hac structura est ambigua; cujus vi, in Majori significat *Sentit Socrates*; in Conclusionem, *Sentit Socratem*; Quare Syllogismus habet quatuor terminos.

3. 4. Fallacia *Compositionis*^d, ubi datum in sensu

* With the following account of the Fallacies may be compared the corresponding chapter in the Rhetoric, ii. 24. In doing so, however, it must be remembered, that the present sophisms occur in a disputation carried on in colloquial form between antagonists, and conforming to established rules; whereas those are introduced *ad libitum* by an Orator in the course of his speech. Hence, though the principle of deception may be similar, the manner of its application will not always correspond. The same caution is still more necessary in examining modern specimens of Sophistry.

^d This Fallacy, as treated by Aristotle, includes a wrong composition of clauses in a sentence capable of two punctuations. In this extension, the examples *possibile est sedentem stare, &c.* are easily included under Composition; the sense varying according as *sedentem* is joined with *possibile est*, or with *stare*. The Fallacy of Division, in like manner, will include the separation of clauses which ought to be united.

diviso sumitur in sensu composito; ut, *Duo et Tria sunt Par et Impar: Quinque sunt Duo et Tria; Ergo Quinque sunt Par et Impar*°. Fallacia *Divisionis*, quando datum in sensu composito sumitur in diviso; ut, *Planetæ sunt septem: Sol et Luna sunt Planetæ; Ergo Sol et Luna sunt septem*. Utroque modo quatuor sunt termini si aperte loquaris. V. g. Prioris Syllogismi mens est, Duo et Tria *seorsim accepta* sunt Par et Impar. Quinque sunt Duo et Tria *in unum composita*, &c. Posterioris vero, Planetæ *collective sumpti* sunt septem; Sol et Luna sunt Planetæ *distributive sumpti* &c. Unde duplex utrobique Medius.

Soph.
Elench.
4. 7. 20. 1.

“Huc referri solent hujusmodi Orationes; *Possibile est album esse nigrum; Possibile est sedentem stare*: dubito an satis recte; quia tanto *acumine* non est opus. Potest quidem album *fieri* nigrum; et Possibile est *sedenti* stare; at *si hæc velles*, incongrue locutus es. Utraque igitur Oratio est simpliciter neganda; vel ut aperte falsa si sit congrua, vel si non sit congrua, quia non est Propositio.”

Soph.
Elench.
4. 8. 21. 1.

5. Fallacia *Accentus* seu *Prosodiæ*† potius, quando

• In these instances, the verbal defect lies in the copula. Two and three *are* (constitute) five. Two and three *are* (severally) even and odd.

† The *Fallacia Prosodiæ*, as Aristotle observes, is a Fallacy in writing only, not in speaking. *Lépores* and *lepôres* have no ambiguity when rightly pronounced. The first example (*servus ergo cervus*), supposing the pronunciation of both words to be the same, is not properly an instance of this Fallacy.

pro eodem sumuntur quæ vel Litera, vel Spiritu, vel Tempore, vel Accentu sunt diversa: ut, Est *servus* Ergo est *cervus*; Est *ara* Ergo est *hara*. Est *malum* (an apple) Ergo malum (an evil). Venatur *lépores* Ergo et Lepóres; quibus qui falli potest, debet.

6. Fallacia *Figuræ dictionis*, quando propter ^{Soph. Elench. 4. 9. 22. 1.} dictiones similes, quod de uno datur de altero arripitur: idque vel *Grammaticæ*⁶, ut *Musa* est

⁶ *Grammaticæ*, i. e. inferring that *Poeta* is of the feminine gender, because the majority of words with the same termination are so. *Logice*, inferring that *videre* belongs to the category of *ποιεῖν*, because most infinitive moods of this form are included under it. Thus viewed, it may be classed as *in dictione*, because the rules of gender and conjugation are different in different languages.

But the more common form in which this Fallacy would be stated is that of an induction, or rather a number of examples, after the manner of Socrates. Indeed, this very sophism is put into the mouth of Socrates by Aristophanes, *Nubes*, 681 sqq. Stated in this form, the logical inconsequence is obvious; as also if it is reduced to syllogism. "Such and such words are feminine; *Musa resembles* such and such words." Here there is no middle term. This ambiguity is sometimes called *multiplex phantasticum*. Cf. Petr. Hisp. Summ. Log. Tract. vi. "Est autem multiplex phantasticum, quando aliqua dictio significat unum et videtur significare aliud, propter similitudinem quam habet in parte cum alia dictione; ut *videre* significat passionem, et videtur significare actionem, propter hoc quod est simile huic verbo, *agere*." In this form, it would seem more naturally to belong to the class *extra dictionem*.

In *Rhet. ii. 24. 2*. Aristotle gives another form of this Fallacy; viz. when a series of detached propositions are so enunciated as to appear logically connected, not being really so. See also *Soph. Elench. 15. 5*.

Fœminini generis, Ergo et *Poeta*: vel *Logice*, ut *Docere est agere*, Ergo et *Videre*. Hæc Materia potius quam Forma peccat: et operose solvi non postulat: ponit aliquid aperte falsum; quo negato evertitur.

Soph.
Elench.

Fallaciæ *extra dictionem* sunt septem ^h.

4. 10.

Soph.

Elench.

5. 1. 24. 1.

§. 4. 1. FALLACIA *Accidentis*ⁱ; quando *accidentarium* aliquod confunditur cum eo quod est *essentiale* seu principaliter intentum: ut, *Quod emisti comedisti, Crudum emisti*; Ergo *Crudum comedisti*: in quo, *Quod emisti*, et *Quale emisti*, confunduntur; unde quatuor termini.

Soph.

Elench.

5. 2. 25. 1.

2. Fallacia *a Dicto secundum Quid ad Dictum Simpliciter*; quando proceditur a voce determinate sumpta, ad eandem absolute positam: ut, *Æthiops est albus dentes*; Ergo *albus*: unde quatuor esse Terminos necesse est ^h.

^h Fallacies *extra dictionem* embrace all those in which the deception arises from any other cause than ambiguity of language; whether from a false assumption in the premise, or from the reasoning being unsound. Purely logical fallacies belong, not to the *in dictione*, but to the *extra dictionem*.

ⁱ The example of this Fallacy given by Aristotle is, Coriscus is different from Socrates; Socrates is a man; therefore Coriscus is different from a man. The Fallacy lies in assuming that whatever is different from a given subject is incompatible with all the predicates (*τὰ συμβαίοντα*) of that subject. The reasoning is thus illogical: Socrates is a man; Coriscus is not Socrates; therefore Coriscus is not a man.

^h The example as stated by Aristotle will run thus; *Æthiops*

3. Fallacia *Ignorationis Elenchi*. *Elenchus*¹ proprie Syllogismus est Adversarium redarguens: confirmando scil. quod illius sententiæ contradicat. Quare in hanc incidit Fallaciam qui se putat Adversarium redarguere, non servatis *Contradicendi Legibus*, (de quibus vide pag. 54.) Qui in his peccat, docendus est se nescire Quid sit Contradicere.

Soph.
Elench.
5. 5. 26. 1.
An. Pr. II.
20. 1.
Soph.
Elench.
6. 4.

4. Fallacia *a non-causa pro causa*^m; sive sit *a non est albus; Æthiops est albus dentes; Ergo, qui est albus non est albus*. Here there are four terms, and the Conclusion, as Aristotle himself observes, is not drawn *sylogistically*.

Soph.
Elench.
5. 11. 29. 1.
An. Pr. II.
17. 3.

¹ The Elenchus is defined by Aristotle, συλλογισμὸς ἀντιφάσεως, An. Pr. ii. 20. 1. Soph. Elench. 6. 4. The *Ignoratio Elenchi* consists in neglecting some of the conditions required by the rules of Dialectic for proving the contradictory of any given proposition. This is the case when the conclusion does not logically follow from the premises; or when the premises themselves are not admitted by the opponent; or when the conclusion, though legitimately deduced from allowed premises, is an apparent, not a real, contradiction of the opponent's position, failing in one of the four conditions of contradiction, viz. *eodem modo, secundum idem, ad idem, eodem tempore*. In this extended sense, every fallacy is an Ignoratio Elenchi, as is observed by Aristotle, Soph. Elench. 6. 1. though the name is especially applied to the last instance.

^m This fallacy, according to Aristotle, most frequently occurs in the *deductio ad impossibile*, and consists in pretending that the proposition which we wish to refute is the cause of the false conclusion, which in reality follows from other premises; i. e. in maintaining that the conclusion is false because *that particular assumption* is false. This mode of deception has place in dialectical disputation, from the practice of asking the opponent to grant certain premises. An unnecessary proposition is asked and granted among the rest, and after-

non-vera pro *vera*; sive a *non-tali* pro *tali*^a: ut *Cometa fulsit*; Ergo *Bellum erit*; Nullo modo; nam si fuerit, aliis de Causis futurum est. *Quod inebriat prohibendum est*; *Vinum inebriat*; Nequaquam vero, sed Abusus vini. Hæc Fallacia bene solvitur negando Causam falsam; melius, adducendo germanam.

"Huc refertur ab aliquibus (qua de causa non video) hoc Sophisma; *Qui magis esurit, plus comedit*; *Qui minus comedit, magis esurit*; Ergo *Qui minus comedit, plus comedit*. Sed qui hoc, vel hujus simile attulerit (ut innumera afferri solent) docendus est congrue loqui: Hoc si fecerit, dicet in hoc casu, *Qui magis esurit plus comedit*; *Qui minus comedit, magis esurit*; Ergo *Qui minus comedit, plus comedit*."

Soph.
Elench.
5. 8. 28. 1.

5. Fallacia *Consequentis*^o, quando infertur quod

wards selected as the false assumption. Aldrich's examples refer rather to the rhetorical than to the dialectical form of this fallacy. In this the speaker is guilty merely of a false assertion, attributing a certain effect to a wrong cause. See Rhet. ii. 24. 8.

^a In the *non vera pro vera*, there is no connexion between the effect and the supposed cause; in the *non tali pro tali*, there is a connexion, but an insufficient one; wine, e. g. does not intoxicate except in certain quantity. This instance, however, more properly belongs to the fallacy *a dicto secundum quid ad dictum simpliciter*. "Wine (in excess) intoxicates; therefore, Wine (absolutely) is to be forbidden."

^o The *fallacia consequentis* is an error in reasoning, as may be clearly seen in the examples given Soph. Elench. 5. 8. and Rhet. ii. 24. 7. e. g. Honey is yellow; Gall is yellow; there-

non sequitur: ut, *Animal est*; Ergo, *Est Homo*. Hic memineris, quod si recte ratione uti volumus, Consequentia aut directa, immediata, formalis, aut plane nulla est; peccat enim contra aliquam Dialecticæ regulam; ad quam si provoces, refelletur.

6. Fallacia *Petitionis Principii*^p, cum ut datum assumitur, quod probatum oportuit. V. g. Cum probatur aliquid vel per seipsum, (quæ vocatur *Petitio statim*,) ut, *Homo est*, Ergo, *est Homo*:
Soph. Elench. 6. 7. 27. 1. Anal. Pr. II. 16. 1. Top. VIII. 18. 1.
 Vel per Synonymum; ut *Ensis est acutus*; Ergo, *Gladius*: Vel per æque ignotum; ut *Hic est Pater Melchisedek*; Ergo, *Hæc Mater*: Vel per ignotius; ut, *Hoc Quadratum est hujus Trianguli duplum*, Quia *huic Circulo æquale*: Vel per Circulum; resumendo scilicet quod relictum est; ut si diceres, *Ignis est calidus*, Ergo *urit*: et post pauca, *Ignis urit*, Ergo *est calidus*.

7. Fallacia^q *plurium interrogationum*, quando plures quæstiones velut una proponuntur; v. g. *Suntne Mel et Fel dulcia?* *Estne homo animal et*

fore gall is honey. Here the middle term is undistributed. Another specimen cited by Aristotle is the reasoning of Melissus; "Whatever is generated has a beginning; the universe is not generated; therefore it has not a beginning." Cf. Phys. Ausc. I. 3. 2. Here there is an illicit process of the major term.

^p On the *Petitio Principii*, see Appendix, note E. Aristotle enumerates five varieties; which, however, are not the same as those given by Aldrich. See Top. viii. 13.

^q This is merely a dialectical fallacy; and consists in entrapping an opponent into an answer partly false, by artfully putting two questions as one.

lapis ? Evertitur, ad singulas questiones distincte respondendo ; sicut fecit Menedemus Eretriensis, qui rogante eum Alexino, *Numquid Patrem verberare desiisset* ? *Nec verberavi*, inquit, *nec desii*^r.

Atque hæ sunt tredecim Sophismatum formulæ^a Veteribus usitatiores, quæ Tironibus Logicis in exemplum proponi solent. Poterant esse pauciores ; nam videntur aliquæ coincidere ; et præterea tres, *Non-causa pro Causa*, *Petitio Principii*, et *Plures interrogationes*, non sunt Fallaciæ proprie dictæ, h. e. Syllogismi Forma peccantes^t ; sed Vitia male Opponentis. Poterant et plures^u ; sed cum hic numerus Aristoteli satisfecisset, idem omnibus post illum Logicis satisfecit.

§. 5. SOPHISMATIBUS ex sententia veterum accen-

^r Diog. Laert. ii. 135.

^a These thirteen fallacies are comprised in the mnemonic lines,

Æquivocat, Amphi. Componit, Dividit, Acc. Fi.

Acci. Quid, Ignorans, Non causa, Con. Petit. Interr.

^t Aristotle's definition of Fallacy will include logical deductions from false premises, as well as illogical deductions from any premises. See Top. i. 1. 3. Ἐριστικός δ' ἐστὶ συλλογισμὸς ὁ ἐκ φαινομένων ἐνδόξων, μὴ ὄντων δέ, καὶ ὁ ἐξ ἐνδόξων ἢ φαινομένων ἐνδόξων φαινόμενος. Aldrich's limitation to Syllogisms faulty in form is quite arbitrary.

^u Aristotle does not profess to give a complete enumeration of the fallacies ; but only a list of such as may be solved by the Dialectician. There may be innumerable false assumptions, on matters not belonging to Dialectic, which must be refuted from the principles of the Science or Art to which they belong. See Soph. Elench. 9. 1.

sendæ sunt *Inexplicabiles* (ut vocantur) *Rationes*, quas Megarici, Stoici, alique Eristicam professi, propriis nominibus insignivere, *Crocodilus*, *Mentiens*, *Obvelatus*, &c. quas plerasque collegit *Gassendus*, et retulit in *Libro de Origine et Varietate Logicæ*: Nos eodem fere ordine explorabimus quo ab illo sunt propositæ.

1. ACHILLES vocatur Argumentum quo usus est Zeno Eleates, non ut Motum tolleretur, quod vulgo sed falso dicitur; sed ut ostenderet Continuum non esse infinite divisibile, quia hoc dato Motus tolleretur. Argumentum sic se habet. Sit Achilles quantum voles *πόδας ὠκὺς*, puta decuplo velocior Testudine. Quiescente illo, confecerit Testudo partem aliquam (puta decimam) spatii percurrendi. Tum procedat Achilles, idemque spatium percurrat: progredietur interim Testudo per partem ejus decimam, h. e. totius spatii centesimam; hanc conficiat Achilles, et percurret interim Testudo hujus centesimæ decimam; et sic deinceps in infinitum; quo fiet ut Achilles nunquam assequatur Testudinem*.

Arist. Phys.
Ausc. VI.
9. 8.
Top. VIII.
8. 2.
Soph.
Elench.
24. 5.

* We must not confound the metaphysical difficulties connected with the infinite divisibility of space, with the logical difficulty of a false conclusion apparently deduced from true premises. Archbishop Whately evades the latter, by observing, that the sophism cannot be exhibited in a Syllogism. But this confession is in fact a surrender of the syllogistic criterion, as a means of discriminating between sound and unsound reasoning. On the contrary, nothing is easier than to exhibit the reasoning in a Syllogism, and to shew thereby

Ineptum est hoc Sophisma. 1. Quia solvitur ambulando; quod fecit Diogenes'. 2. Quoniam ex ipsa Hypothesi, Dum Testudo quæ præcessit spatio A, conficit $\frac{2}{10}$ A, Achilles conficiet 2 A;

that the fallacy does not lie in the form, but in the matter. Thus, representing the whole space to be traversed by a.

"Any space equal to $\frac{a}{10} + \frac{a}{100} + \frac{a}{1000}$ &c. is infinite, (being the sum of an infinite series.) The space to be passed before Achilles overtakes the tortoise is equal to this sum. Therefore it is infinite."

The whole logical mystery of this famous fallacy lies in this, that *the major premise is false*. The sum of an infinite series may be, and in this case is, finite. This premise is equally false, whether space is or is not divisible *ad infinitum*. On the metaphysical question connected with the matter of the sophism, see Hegel, *Werke*, vol. iii. p. 218. Fries, *System der Logik*, §. 109. Herbart, *Einleitung in die Philosophie*, §. 189. Trendelenburg, *Logische Untersuchungen*, vol. i. p. 179. The solution attempted by Coleridge, (*Friend*, vol. iii. p. 93.) is refuted by Herbart.

It may be observed, that Aldrich is mistaken as regards Zeno's object in this Sophism. It was proposed to support the leading tenet of Parmenides, of the unity of all things, by shewing that the identity of rest and motion is a necessary result from the contrary opinion. It does not appear, however, that Zeno advanced this argument seriously. His principal design was to retort the ridicule which had been thrown on the doctrine of Parmenides, by involving his opponents in the same absurdities which they professed to find in his theory. Cf. Plato, *Parm.* p. 128. Arist. *Soph. Elench.* 10. 2. 33. 4. Cousin, *Nouveaux Fragments, Zénon d'Elée*.

The solution of Diogenes proves nothing. Zeno contends that reason contradicts the evidence of the senses. Diogenes replies that the evidence of the senses contradicts that of reason. Who denied that?

adeoque statim assequetur eam, et antecedit*. Sed hoc (inquies) in casu proposito nunquam fiet; Recte; Ne enim fiat, in ipso proponendi modo clam inseritur nova conditio. Nam 3. Argumentum aliis verbis hoc dicit; Si Achillem decuplo velociorem præcesserit Testudo; et *uterque meo pergat arbitrato*; Ego perficiam ne Achilles assequatur Testudinem: Quare prorsus nunquam assequetur. Quæ est *Fallacia a dicto secundum quid, ad dictum simpliciter*.

2. Diodorus Cronus, quod Sophismata Stilponis non solvisset, exinde ὄνος appellatus est*; id cognominis aliunde promeritus, quod ad hunc modum contra Motum disputaret. *Mobile movetur vel in quo est loco, vel in quo non est; At neutrum horum; Ergo Non omnino*. Unde facete illum lusit Herophilus, qui ut luxatum illi humerum restitueret rogatus, *Tuus* (inquit) *humerus vel in quo erat loco*

* The futility of this attempt at solution might have been learned from Aristotle, *Soph. Elench.* 24. 5. It only shews that the contradictory assertion rests also on seemingly valid reasoning; whereas the duty of the opponent is to shew where the fallacy of Zeno's reasoning lies.

* The facetious Iambics in which Diodorus was thus "writ down an ass" are as follows:

Κρόνε Διόδωρε, τίς σε δαιμόνων κακῇ
 Ἀθυμία ξυνείρυσεν
 "Ἴν' αὐτὸς αὐτὸν ἐμβάλης εἰς τάρταρον,
 Στίλπωνος οὐ λύσας ἔπη
 Αἰνιγματώδη; τοιγὰρ εὐρέθης Κρόνος
 Ἐξω γέ τοῦ ῥῶ κάππα τε.

See *Diog. Laert.* ii. 112.

existens excidit, vel in quo non erat. Sed neutrum horum; Ergo non omnino. Diodori argumento breviter et perspicue respondet Gassendus, Quod movetur moveri *a loco* in quo erat, *per locum* in quo est (sive quem pertransit), *ad locum* in quo nondum est, sed futurum est ^b.

3. RECIPROCUM vocat Argumentum *Gellius*, quod Græce dicitur *Ἀντιστρέφον*: cui illustrando conficta est Fabula quæ Græcorum vanitatem olet. Narrant enim inter Protagorum et Euathlum, vel (ut facetiæ locus sit) inter Coracem^c et Tisiam convenisse, ut hunc ille Dialecticam doceret; idque hac lege, ut dimidium mercedis statim acciperet; reliquum, cum discipulus causam vicisset.

^b The true solution of the sophism of Diodorus is, that the disjunctive premise is false. "The place where a body is," is contradictory of "the place where a body is not;" as "Englishmen" is contradictory of "not-Englishmen;" but "moving in the place where it is," is no more contradictory of "moving in the place where it is not," than "an army composed of Englishmen" is contradictory of "an army composed of not-Englishmen." As it would be false to say, "every army must be composed of Englishmen or not-Englishmen," to the exclusion of the third possibility of a mixed force, so it is false to say, "Every body must move in the place where it is, or in the place where it is not," to the exclusion of the third possibility of moving partly in the one and partly in the other. This solution is substantially given by Hobbes, *Philosophia Prima*, P. II. c. 8. §. 11.

^c The story is told of Protagoras and Euathlus by Aulus Gellius, v. 10. and by Apuleius, *Florid.* iv. 18.; of Corax, by Sext. Empir. *adv. Math.* p. 81. Cf. Menag. ad Diog. Laert. ix. 56.

Primam exinde litem cum Discipulo contestatus est Magister, cum mercedis reliquum lege peteret; apud Judices vero sic agebat: *Ego si vicerō, Tisia, Tu solves ex sententia, sin minus, ex pacto; utroque igitur modo solvendum est.* Respondit Tisias, *Ego nihil solvo; Tu si viceris, ex pacto; sin minus, ex sententia.* Tanto utrinque acumine perculsi boni judices, exclamarunt *Κακοῦ Κόρακος κακὸν ὦν*, causamque in longissimum diem distulerunt.

Ineptum erat Coracis Dilemma quia potuit tam bene retorqueri. Nihilominus callide agebat, si id Judices vidissent. Nam cum mercedem inique peteret, causa cadere debebat; Quamprimum autem cecidisset, ei merces ex pacto debebatur.

§. 6. 4. MENTIENS quæ est Græce *Ψευδόμενος*^{d, Soph. Elench. 25. 3. Eth. Nic. VII. 3. 8.} Chrysippi Syllogismus ne ab ipso quidem solutus, præter cæteros insolubilis habetur. Eum Cicero^e sic enuntiat: *Si dicis Te mentiri, et verum dicis, mentiris; Sed dicis Te mentiri, et verum dicis; mentiris igitur.*

Congrue loquere, Chrysippe, et intelliges Te vel nihil prorsus, vel nihil dicere difficile. Qui se dicit

^d This Fallacy is attributed to Eubulides of Miletus. See Laert. ii. 138. It is mentioned by Aristotle, Eth. Nic. vii. 3. 8. and consequently must be older than Chrysippus.

^e Acad. Quæst. iv. 30. Its solution is obvious. No one can lie without lying about something. The something is not stated in the sophism. The question as it stands is unmeaning. Is this thing very like? Like what?

mentitum, et verum dicit, *mentitus est*; *Qui mentiturum, mentietur*. Horum utrumque verum est, et nemini obscurum. Sed qui ut verum simul dicat et mentiatur dicit unum aliquid, cujus partes sibi invicem contradicunt, is nec verum, nec falsum, sed omnino nihil dicit: quando enim sententiæ pars una evertit alteram, tota nihil prorsus significat, sed inaniter strepit.

Subtilius disputare videbantur qui sic agebant. *Cretenses esse mendaces dicit Epimenides Cretensis. Mentitur igitur; Ergo Illi sunt veraces; Ergo et Ille verum dicit; Ergo Illi rursus sunt mendaces &c.* Sed profecto nihil stultius est hoc Argumento, nisi vox *Cretenses* eos ad unum omnes significet, et Omnis mendax quicquid dicit mentiatur¹.

Videtur hic *Mentiens* peperisse subtilem illam Scholasticorum *de Insolubilibus* doctrinam. "Nam talia argumenta (inquit *Occam*) non possunt fieri " nisi quando actus humanus respicit istum terminum *Falsum*, vel aliquem consimilem affirmative; " vel hunc terminum *Verum*, vel aliquem consimilem " negative²." Esse hæc *Sophismata* ante dixerat; nec vocari *Insolubilia*, " quia nullo modo solvi " possunt, sed quia cum difficultate solvuntur."

Insolubilis exemplum sic proponitur. Incipiat Socrates sic loqui, *Socrates dicit falsum*; et nihil

¹ This fallacy is solved by Fries, §. 109. A man who is always a liar cannot possibly say or imply "I lie;" for this would be a truth, and thus he would not be always a liar.

² Occam, *Logica*, iii. 8. cap. 45.

amplius loquatur: tum interroget aliquis, utrum vera an falsa sit hæc propositio. Respondeo, nec veram nec falsam esse, sed nihil significare, nisi aliquid aliud respiciat, quod a Socrate ante dictum supponitur. Qui enim profert hæc verba, *Socrates dicit falsum*, fert iudicium de dicto Socratis; quique fert iudicium, necessario præsupponit aliquid de quo iudicet: Unde cum sententia præsupponat objectum suum, clarum est eandem numero propositionem, et sententiam et ejus objectum esse non posse. Quare et Scholarum subtilitas hic nihil proficit; nihilque opus est plura dicere de Insolubilibus.

5. FALLENS *Διαλανθάνων*^b, vel ut alii *Διαλεληθὼς*, de Juramento ludit sicut *Mentiens* de nuda affirmatione. E. g. *Qui jurat se falsum jurare et falsum jurat, vere jurat*. Quare eodem fere modo quo *Mentiens* explicatur.

§. 7. 6. 7. OBVELATUS, alio nomine ELECTRA, est ^{Soph. Elench. 24. 2.} *Fallacia a dicto secundum Quid ad dictum Simpliciter*. Nam colligere pertendit, quod et Patrem Filius et Soror Fratrem, h. e. Electra Orestem prorsus nesciat, si eundem *velo obductum* se nescire fateaturⁱ.

^b The *Διαλανθάνων* is probably a similar Fallacy to the Electra and the Obvelatus. The honour of its invention is divided between Eubulides and Diodorus Cronus. The example given by Aldrich is a mere conjecture of Gassendi's.

ⁱ The Fallacy of the Electra is founded on Sophocles, Elect. 1222. It is given as follows by Lucian, Vit. Auct.

8. 9. ACERVALIS et CALVUS^k, sunt ejusdem Sophismatis duo tantum Exempla. V. g. Si rogatus a Sophista, neges te *Calvum* fieri amisso crine uno, duobus, tribus, et sic deinceps ad 99, sed amissis centum concedas; vel eodem modo neges 99 grana *Acervum* esse, centum autem esse fatearis; concludet ille grano unico adjecto *Acervum* fieri; crine unico amisso, *Calvitium*. Facile autem respondetur, *Unum centesimum* non esse *Unicum*; nam est *Unum* cum nonaginta novem. Vel si mavis sic; Fit *Acervus*, grano uno, sed adjecto; adeoque non unico, sed cum pluribus aliis. Fit *Calvities* crine uno, sed post multos alios, amisso.

10. CORNUTUS et *Ceratinus*, *Ceratine*, *Ceratis*, et *Ceras* dicitur Sophisma illud ante memoratum,

§. 22. παρεστῶτος γὰρ αὐτῇ τοῦ Ὁρέστου ἔτι ἀγνώτος, οἶδε μὲν Ὁρέστην, ὅτι ἀδελφὸς αὐτῆς· ὅτι δὲ οὗτος Ὁρέστης, ἀγνοεῖ. The Obvelatus is of similar character. ΧΡΥΣ. Ἦν σοι παραστήσας τινὰ ἐγκεκαλυμμένον, ἔρωμαι, τοῦτον οἶσθα; τί φήσεις; ΑΓΟ. Δηλαδὴ ἀγνοεῖν. ΧΡΥΣ. Ἀλλὰ μὲν αὐτὸς οὗτος ἦν ὁ πατήρ ὁ σός, ὥστε εἰ τοῦτον ἀγνοεῖς, δῆλος εἶ τὸν πατέρα τὸν σὸν ἀγνοῶν. Another variety of the same sophism will be found in Aristotle, *Soph. Elench.* 24. 2. where it is classed under the *Fallacia Accidentis*. Diogenes Laertius, ii. §. 108. attributes the *Electra* and *Obvelatus* to Eubulides, as well as the *Acervus*, *Cornutus*, and *Calvus*.

^k These two Fallacies, which are in fact but one under different names, are alluded to by Horace, *Ep.* ii. 1. 45. and by Persius, *Sat.* vi. 80. The *Acervus* is frequently called *Sorites*, (cf. Cic. *Acad. Quæst.* iv. 49. *De Divin.* ii. 11.) but must not be confounded with the series of syllogisms of the same name.

Quod non amisisti habes &c. Quæ est *Petitio Principii*; nam supponit Te cornua habuisse.

Ineptissima hæc Fallacia plus acuminis præfert juxta veterem Disputandi modum rogando proposita. Erit enim fortasse, qui rogatus, *Quod non amiserit, utrum habeat necne* ? non intelligat se captum iri, si simpliciter respondeat; sive habere se, sive non habere dicat. Nam eum adiget Sophista, ut vel se habere Cornua, vel non habere Oculos fateatur.

11. Acutus sibi videbatur Menedemus (Eretriensis scil. quem *ἐπιστικώτατον* appellat Laërtius) quum ad hunc modum nugaretur. *Diversum, a Diverso Diversum est; Prodesse est a Bono Diversum; Prodesse igitur non est Bonum*¹. Quæ est crassa et putida *Æquivocatio*; et nihil amplius.

§. 8. 12. CROCODILUS^m a Chrysippo inventus, qui ad Fallaciam Consequentis revocari poterit, sic proponitur. *Surripuerat infantem Crocodilus; redditurum se, hac lege pollicitus, ut divinet mater, utrum apud se reddere an non reddere constituerit.* Si dicat mater *Non reddere*; mentietur si infantem receperit: Si dicat *reddere*; non reddet quia hoc est falsum. Quamobrem Chrysippus nihil esse putat difficilius quam responsum matri suggerere.

¹ Diog. Laert. ii. 134.

^m This Fallacy is given at length by Lucian, Vit. Auct. §. 22.

Nec injuria, si lubricum putet divinare; sed immerito, si in hoc (ut videtur) hæreat, Quod si puerum Crocodilus non reddere constituerit, quamvis id Mater divinaverit non reddet: quasi consilium quod primum intenderat Crocodilus, postquam indicatum est, repudiare non possit, et ex pacto non debeat: nam si Mater recte divina-verit, recepto puero, non mentitur illa, sed consilium mutat Crocodilus.

13. METENS *Θερίζων* qui vocatur, ita placuit Zenoni Stoico, ut Sophistæ a quo eum didicerat duplum pactæ mercedis numeraret. Proponente Ammonio^a sic se habet. *Si messurus es, non fortasse metes, fortasse non metes, sed metes omnino; Pariter, si non messurus es, non fortasse metes, fortasse non metes, sed prorsus non metes. Atqui vel metere te, vel non metere, necessarium est; perit igitur Fortasse, quod in neutra hypothesi locum habet. Fortunatum Sophistam! qui mercede dupla hunc fumum vendidit; Vel hoc, vel illud evenire est necesse; Quare hoc et non illud necessario eventurum est. Nihil amplius dicit qui sic dixerit, Ut vel metas vel non metas est necesse: Ergo Vel necessario metes vel necessario non metes. Breviter, hæc Fallacia Divisionis est; nam in Antecedente, Modus Necessario, non tribuitur nisi toti Disjunctivæ; sed in Consequente dicitur de ejusdem membris seorsim acceptis.*

^a *In de Interp.* sect. 2. cap. 10. cf. Menage ad Laert. vii. 25.

14. IGNAVA RATIO vel Ἀργὸς λόγος appellatur°, qui si valeat nihil est omnino quod agamus in vita. V. g. *Si Fatum est ægroto convalescere, sive medicum adhibuerit sive non adhibuerit, convalescet*: Pariter, *si illi Fatum est non convalescere, sive medicum adhibuerit, sive non adhibuerit, non convalescet*: et alterutrum *Fatum est*; medicum ergo adhibere nihil attinet. Lepide respondit Chrysippus posse esse *Confatalia* adhibere medicum et convalescere: Quemadmodum et Zeno, quando servum furem verberabat, *Furari sibi Fatum esse* dicenti, et *Vapulare* respondit. Sed commodius dici videtur, Si sit Fatum, hoc valere argumentum; idque vel solum sufficere ne Fatum esse concedamus. Argumentum hocce et quæ præcedunt pp. 143, 144. N°. 2. et 3. ex Dilemmatis legibus facile solvuntur.

§. 9. PLURA sunt apud Autores Inexplicabilium Rationum nomina; quorum exempla Gassendus quia nusquam invenisset, ipse reperit. Verum ea relinquimus studiosis; quibus etiam consulto est relictum, ut quæ sunt hactenus explicata, illi explicent in Syllogismos conversa. Exempla Gassendi ne desiderent qui libro carent, non pigebit exscribere.

Dominans Κυριεύων. Themistoclis filius nec Græcis imperat, nec de imperando cogitat: Verum imperat Matri, quæ imperat Themistocli, qui

° See Cicero, *de Fato*, c. 12.

Græcis imperat ; *Dominatur* itaque Græcis, *et non-dominatur*^p.

Conficiens Περαιώνων. Multum itineris *conficit*, *et non conficit* Canis, qui in rota gradiens totum diem, ex eodem tamen loco non recedit.

Superpositus vel *Superlativus* Ὑπερθετικός, Soriti forte affinis ; Ut si roges quota sit palea, quæ si mulo *super-imponatur* ille oneri succumbat ?

Soph.
Elench.
22. 12.

Nullus Οὔτις. Homo in Communi nec est hic, nec ille, nec alius homo singularis, Ergo *Nullus*^q. Vel ut tritum Sophisma : *Quod Ego sum, Tu non es ; Ego sum homo ; Ergo Tu non es*. Vel denique ut Chrysippus. *Qui est Megaris, non est Athenis ; Homo est Megaris ; Ergo Homo non est Athenis*^r.

^p The fallacy Κυριεύων is mentioned by several writers, but not explained by any. Cf. Arrian, *Epicteti Dissert.* ii. 19. Lucian, *Vit. Auct.* c. 22. Plutarch, *Sympos.* I. i. 5. Gellius, *Noct. Att.* I. 2. It probably derived its name rather from its supposed dignity as an argument than, as Gassendi conjectures, from the mention of a ruler. The same may be said of the Περαιώνων or *conclusive* sophism.

^q This sometimes appears in another form, as one of the various expositions of the celebrated fallacy of the *tertius homo*, alluded to by Aristotle, Soph. Elench. 22. 12. Metaph. i. 9. 3. It is given as follows by Alexander, Schol. p. 314. b. 42. In the proposition, ἄνθρωπος περιπατεῖ, the subject is not the Platonic αἰτοάνθρωπος, who is immoveable, nor yet any individual man ; therefore there is a third man, distinct from the Idea and from the individuals. Cf. Scholia, p. 567. a. 41. Alex. in Metaph. p. 62. ed. Bonitz. Brandis, de perditis Aristotelis libris, p. 18.

^r Ammonius *ad Categ. Arist.* f. 58. οἱ Οὔτιδες παραλογισμοὶ κατὰ τὸν παρ' Ὁμήρῳ Ὀδυσσέα, ἐν καιρῷ Οὔτιν ἑαυτὸν καλέσαντα.

Subjicit Gassendus ex Laërtio, has Chrysippi Rogatiunculas. 1. Qui non initiatis indicat mysteria, impie agit. Sed hoc facit Hierophantes; *Ergo* Impie agit. 2. Est quoddam caput; Id Tu non habes; *Ergo* Caput non habes. 3. Id quod loqueris ex ore tuo egreditur: Currum loqueris; *Ergo* Currus ex ore tuo egreditur.

§. 10. Non temperaturos sibi Juvenes satis scio quin dissiliant risu, ubi hæc tam futilia intellexerint a gravissimis Philosophis serio fuisse proposita; et Veteribus adeo difficilia haberi, ut Philetas Cous præceptor Ptolemæi Philadelphi solius *Mentientis* explicandi studio confectus interierit. Quamvis autem Aristotelis beneficio, videantur ista ut sunt levia, in iis tamen prompte atque artificiose solvendis non inutiliter sese Juvenes exercebunt: nam in gravissimis Disputationibus, hæc eadem recocta Novæ præsertim Philosophiæ cultores sæpissime reponunt.

V. g. *Gassendus* Vacuum quod appellat *disseminatum* eodem fere Sophismate demonstrare perterrit, quo olim Zeno *contra motum* utebatur: Suamque *Hobbius* de *Necessitate* sententiam iisdem propugnat Fallaciis quibus *Fatum* Stoici: aliaque plurima hujus generis, quæ sunt Nobis prætereunda, studiosis inter legendum occurrent.

Οὐτινος παραλογισμοῦ παράδειγμα. Εἴ τις ἐστὶν ἐν Ἀθήναις, οὗτος οὐκ ἔστιν ἐν Μεγάροις· ἄνθρωπος δὲ ἐστὶν ἐν Ἀθήναις· ἄνθρωπος ἄρα οὐκ ἔστιν ἐν Μεγάροις.

Fefellit Virum satis alias perspicacem hæc sequela, quæ in Ambiguis distinguendis versatum minime (opinor) fefellisset; *Possum datæ peripheriæ trientem exhibere; Possum igitur datam peripheriam trisecare*: cujus falsitatem ipsa Praxis redarguit; neque enim trientem exhibuit, sed alterius circuli peripheriam trienti parem: h. e. non *trientem* ipsum, sed *trientis valorem*: Paria fecisset qui oblatum sibi solidum trisecturus, ne attrectato quidem solido porrexisset drachmam.

§. 11. VOLENTEM hic desinere pungit scrupulus, qui nonnullos hodie Mathematicos male habet. Nam in Demonstrationibus quibusdam, Conclusionem ex sui Contradictoria, per legitimas necessariasque consequentias directe inferri volunt. Quod si ita sit, miror a Veteribus, præsertim Scepticis non fuisse animadversum; quippe hoc dato tota ruat Logica necesse est.

Dicunt tamen Theodosium demonstrasse quod *si Maris superficies non est Sphærica, est Sphærica*. Verum ille nihil tale demonstravit; sed tantum Maris superficiem *si nondum esset, fore Sphæricam*: siquid enim emineat (inquit) illud statim, ex natura humidi, subsidet: Unde si Maris superficies sit (ut non est) inæqualis, *fiet* perfecte Sphærica.

Videamus aliud Exemplum. Sunt numeri duo inæquales, et inter se primi; Dico quod eorum differentia ad minorem prima est. *Esto enim numerus aliquis qui metitur minorem*; idemque

metiatur differentiam : Ergo metitur eorum summam ; Ergo metitur majorem, huic summæ parem ; *Ergo non metitur minorem.*

Possum hoc loco dicere quod mendose colligitur ; siquis enim numerus minorem metiatur ex supposito, et majorem ex demonstrato ; colligendum erat *datos esse inter se compositos, quod est contra Hypothesin.* Verum ne pluribus exemplis sim molestus, malo generale responsum. Dico igitur, Quod nulla hujusmodi Demonstratio supponit solam suæ Conclusionis Contradictoriam ; sed quælibet cum Contradictoria ponit aliquid quod eam evertit ; et evertere, demonstrando ostendit. Quare Conclusionem non infert ex ejus Contradictoria ; sed ex Contradictoria cum Contradictoriæ ever-siva : quod si faciat nihil mirum. Nam *Si Socrates v. g. est homo, et irrationalis, tum Si est homo, non est homo : Et Si Socrates est mortuus, et scit se esse mortuum, tum Si est mortuus non est mortuus :* Et Universaliter, *Si et hæc est vera et quæ hanc evertit : tum Si hæc est vera, non est vera :* quibus omnibus inest una quæ est prorsus nulla difficultas. Ubi enim Hypothesis evertit suppositionem, quidni ex Hypothesi sequatur, quod Suppositioni contradicit ?

APPENDIX.

- A. ON THE PREDICABLES.
- B. ON THE CATEGORIES.
- C. ON DEFINITION.
- D. ON MATERIAL AND FORMAL CONSEQUENCE.
- E. IS THE SYLLOGISM A PETITIO PRINCIPII?
- F. ON THE ENTHYMEME.
- G. ON INDUCTION.
- H. ON EXAMPLE AND ANALOGY.
- I. ON THE HYPOTHETICAL SYLLOGISM.
- K. ON THE DEMONSTRATIVE SYLLOGISM.



APPENDIX.

NOTE A.

ON THE PREDICABLES.

It has been already observed that the ordinary logical account of the Predicables, even in its least objectionable form, as it occurs in the *Isagoge* of Porphyry, cannot be consistently maintained, except upon Realist principles. By this is meant, that there are portions of that account altogether untenable, except on the supposition that Genera and Species are not mere conceptions of the human mind, but have an independent existence in Nature. Whether they are to be regarded as existing separately, as in the Platonic theory of ideas, or in the individuals, according to the view sometimes attributed to Aristotle, (for both these opinions had their advocates among the Schoolmen^a;) is in this respect immaterial; though it may be observed by the way, that of the various modifications to which Realism has at different times been subjected, the Platonic hypothesis is by far the most consistent and intelligible. The

^a Both were early, almost simultaneous, developments of the scholastic Realism, appearing as soon as the Nominalism of Roscelin compelled the antagonist doctrines to assume a definite form. The Platonic theory was advocated by Bernard of Chartres; the other, ultimately the prevailing doctrine, found its earliest scholastic supporter in William of Champeaux.

points which may be considered as especially demanding the Realist hypothesis are,

1. The admission, under any definition, of an *Infima Species*.

2. The definition frequently adopted of such Species, as being the whole essence of the individuals of which it is predicated.

3. The assumption that every such Species has one absolute differentia, convertible with the Species, and serving to distinguish it from every other.

It is not asserted that these views were held by none but professed Realists. The first, indeed, may be traced to Aristotle, who has by different writers been regarded as a Realist, a Conceptualist, and a Nominalist, in the strictest sense^b; it is also to be found in Porphyry, who in the commencement of his treatise proclaims himself neutral; and it was subsequently adopted by the scholastic Nominalists^c. The second is held by Boethius, who, as far as he had any definite views, rather inclines to Conceptualism^d; and the third, though not formally established in the schools till the time of Aquinas, was afterwards adopted by Nominalists and Realists indifferently^e. But this does not prove the compatibility of the doctrines, but only the inconsistency of their holders. The Realist, when pressed to declare why he has fixed the *Infima*

^b See Hamilton on Reid, p. 405.

^c Abelard, ed. Cousin, p. 537. Occam, Logic, pt. i. chap. 21.

^d Boethii Opera, p. 72.

^e The Porphyrian definition of man, "Animal rationale mortale," was adopted by the earlier Schoolmen, Abelard, Albertus Magnus, and Petrus Hispanus; though sometimes with the saving clause, that it must be understood with reference to the Stoical notions of the Gods. Aquinas was the first who expelled the Genus *animal rationale* from the Arbor Porphyriana, and, limiting rationality to men, distinguished Angels as *intellectuales*. Cf. Summa, P. i. Qu. lviii. 3. Opusc. xlviii. Tract. 1. cap. 4. Tract. 2. cap. 3.

Species at Homo, has an obvious and sufficient answer. I did not make the world, he might say; Substances, universal as well as singular, exist independently of me; I state facts as I find them, and am not bound to determine why they are so. But let a Conceptualist or Nominalist^f talk of a Lowest Species, and he is refuted at once by his own fundamental doctrine. The several Species are our own creation, as abstract ideas, or as significations of words. You have no right arbitrarily to declare that you will form complex conceptions thus low and no lower; or, at least, if you fix such limits for your own convenience, you have no right to impose the same restriction on others.

The same remarks apply to the theory of an absolute differentia, such as *rationale*, predicable of all men and of none but men, and serving to distinguish that species, not from some other given species, but from all others whatever. Porphyry, as has been before observed, ad-

^f Between Nominalism and Conceptualism there is no real difference, unless in conjunction with the latter we maintain the power of the mind to form Universal notions, unaided by verbal or other symbols. And even then, all Nominalism will be Conceptualism, though all Conceptualism will not be Nominalism. For Universals can only be identified with names by considering these as the signs of notions. Yet Nominalism has been accused as destructive of all Philosophy, and that by the advocates of Conceptualism. But the fundamental error of Hobbes and his followers is not their doctrine of Universal *Terms*, but their theory of the import of *Propositions*. The two, however, are not necessarily connected. We may adopt Locke's theory of abstract ideas, without maintaining with him that knowledge is the perception of the agreement or disagreement of two ideas; and we may hold that general notions require the aid of language, without maintaining with Hobbes, that truth and falsehood depend on names, or with Condillac, that science is only a language well constructed. But, not to argue this point here, we may observe, that the Scholastic Nominalists, at least Abelard and Occam, were Conceptualists. With regard to Roscelin, it is hardly fair, upon the slight notices we possess of his views, to identify his Nominalism with that of Hobbes, whom Leibnitz rightly calls, *plusquam Nominalis*. No one can suppose Abelard's *deductio ad absurdum* to be a fair statement of Roscelin's views.

mits only a *relative* differentia. His definition of man is ζῷον λογικὸν θνητόν; *rational* being the differentia of man when compared with brutes; *mortal*, when compared with the Gods^a. But if either of these attributes be selected as the differentia of man *absolutely*, we must again have recourse to Realism to justify the position. If species are made by Nature, they may have been so framed that each has a peculiar characteristic shared by no other. How this can be proved to be the case is another question; but there is no *à priori* impossibility in the supposition. But if the species is but a conception formed by the mind, what is to hinder us from forming four complex notions, *abc*, *abd*, *acd*, *bcd*, of which no part is a differentia absolutely and *per se*, though *c* distinguishes the first from the second, *b* the first from the third, and *a* the first from the fourth?

With regard to the doctrine of the Infima Species being the *whole essence* of the individuals of which it is predicated, the case is still clearer; inasmuch as this language was expressly maintained by the Realists, and expressly repudiated by the Nominalists. It is true that it is previously to be found in Boethius; but here his authority is of little value, as nothing can be more vacillating than his opinions on the whole question. Boethius wrote his Commentaries with the design of reconciling Aristotle with Plato; he succeeded only in contradicting himself. In one of his expositions of Porphyry he goes beyond Plato in Realism; in the other, he is a professed Conceptualist^b. But even had his views been more definite in favour of the latter hypothesis, it would only shew that he admitted details into his system inconsistent, if pushed to their ultimate consequences, with its main positions.

^a Isagoge, iii. 19.

^b Cousin, Œuvres d'Abélard, Introduction, p. 66.

In treating the doctrine of Predicables, two alternatives are open to the modern Logician. Either he may take the scholastic language as he finds it, and explain it with reference to the theories on which it was originally founded; warning, however, at the same time his readers or hearers, that the supposed Real Essences are deserving of the same amount of belief as the Deities of Heathen Mythology, or the Sylphs, Gnomes, and Salamanders of the Rosicrucians: or he may adopt a theory of Universals in conformity with views current in modern philosophy, and remodel the whole account of the predicables, so as to make it consistent therewith. But any attempt at a compromise between the two, any explanation of ancient language upon modern hypotheses, can produce nothing but inconsistency in the Teacher and confusion in the Pupil. In the first place, such explanation, even where most satisfactory, is founded merely on analogy, and hence will rather shew what the doctrines expounded ought to have been, according to modern criticism, than what they actually were. In the second place, the analogy in some important particulars will fail entirely, and the exceptional cases must either by some unnatural distortion be forced under the given classification, or be excluded altogether, to the serious detriment of the completeness of the theory.

To adopt then the first mode of explanation. We will suppose that Genera and Species are *substances*, having a real existence independently of us, and cognisable as to their nature, no matter how, by the human mind. Of these universal substances, some are more extensive, others less so, the limits at both extremities being fixed by nature, and the numbers in each degree settled and unalterable. The higher enter into the composition of the lower, the lowest not contributing to form any other

Universal, but susceptible of Accidents, from which union are formed various Individuals. Man, for example, is a lowest species: to this are added certain accidental modifications which form Socrates, and at the same time others which form Plato. These modifications excepted, there is nothing in Socrates which is not at the same time in Plato, nor in Plato, which is not at the same time in Socrates¹. Moreover, from these Universal Substances, or rather from the distinctive portion of each, certain qualities *flow*, or are produced as effect from cause. Others, not connected by causation, are found in the individuals of this or that Species, some universally in all, others partially, in some individuals only.

From a series of assumptions of this kind, the exposition of the Realist doctrine of Predicables is easy. And this, or some other of the various phases of Scholastic Realism, must of necessity be assumed, if our intention is to explain an old theory, not to construct a new one.

On the other hand, we have the modern Logician expounding somewhat in the following style. Genera and Species have no existence *a parte Rei*, but are notions formed by the mind from observing certain points of similarity in different individuals. But similarity must not be confounded with identity. The image and superscription on two coins may present no discernible marks of distinction from each other; but if on

¹ "Homo quædam Species est, res una essentialiter, cui adveniunt formæ quædam et efficiunt Socratem: illam eandem essentialiter eodem modo informant formæ facientes Platonem et cætera individua hominis; nec aliquid est in Socrate, præter illas formas informantes illam materiam ad faciendum Socratem, quin illud idem eodem tempore in Platone informatum sit formis Platonis. Et hoc intelligunt de singulis speciebus ad individua et de generibus ad species." Abelard, de Gen. et Spec. ed. Cousin. p. 513. This was the first doctrine of William of Champeaux. Other expositions of Realism might be given.

that account we say that they are *the same*, we employ the word in an equivocal sense, which must be carefully distinguished from that in which we say that both are struck from the same die. In the latter sense, the attributes forming the humanity of Socrates are not the same with those forming the humanity of Plato; though the common notion *man* embraces both, and though, by availing ourselves of an ambiguity of language, we say that both are of *the same* species.

General notions thus framed by the mind, when expressed in language, form common terms. And the various attributes comprehended¹ in every such notion are its logical essence¹. By this we do not mean any thing necessary to the physical existence of an object; but merely that, as general notions are formed from the observation of similar attributes in individuals, every individual must possess such attributes, if it is to be included under the extension of the notion and called by the corresponding common name. Proper names, on the contrary, have no essence, as they have no general notion belonging to them, but are mere arbitrary marks

¹ In a Pamphlet published under the name of "A Dissertation on the Heads of Predicables," I inadvertently adopted Mr. Mill's expressions of *connotation* and *denotation*, to distinguish between the attributes contained in a complex notion, and the subjects of which it is predicated. The distinction I still regard as most important, and one that is not perhaps sufficiently marked in modern language; but further study of the scholastic phraseology has led me to regard Mr. Mill's language as too wide a departure from the original use of the terms. For this reason I have preferred the expressions *Comprehension* and *Extension*, as better sanctioned by Logical authority. Cf. Port Royal Logic, P. I. chap. 6. "J'appelle *comprehension* de l'idée, les attributs qu'elle enferme en soi. J'appelle *étendue* de l'idée, les sujets à qui cette idée convient." For the Scholastic Connotation, see p. 16, note g.

¹ This is the *Nominal Essence* of Locke, which corresponds to the Logical Essence of other philosophers, though variously explained according to their different Metaphysical theories. The term *Real Essence* is used by the same philosopher to denote that generally unknown constitution of *individual things* on which their sensible properties depend.

imposed for the purpose of distinguishing individuals from each other.

But though our earliest complex notions may have been gained from real objects, there is no reason why such notions alone should be admitted in a theory of Predication. Such a theory only distinguishes the several relations which the subject and predicate of a proposition may bear to each other. With the objective existence of things corresponding to our general notions, we have for the present no concern. Whatever theory may be adopted as to the origin of our ideas, there can be no doubt that we have the power of forming combinations in the mind, which have not been observed to exist in nature^m. And the relation of subject and predicate in propositions into which such notions enter, may be identified with some of the relations of other notions.

In constructing or explaining a theory of Predication in conformity with these views, there is one ambiguity which it is not possible to avoid, without a coinage of new terms. The distinctions of Genus and Differentia must be gained by comparing two terms not predicable of each other. Compare, for example, Man with Brute, the common Genus will be Animal, the respective Differentiæ, Rational and Irrational. But there is no absolute Genus or Differentia, and frequently, while the whole comprehension of the notion remains the same, the Genus and Differentia may change places, according as it is compared with this or that other notion. In the comparison, for example, of a plane triangle with a parallelogram, "rectilineal figure" is its common, "having three sides" its distinctive part. But compare a plane with a spherical triangle, "having three sides" is common to both; the distinction being, that the sides in the one

^m Cf. Locke, Essay, b. ii. ch. 2. §. 2.

case are straight lines, in the other, arcs of great circles^a. But when one only of the compared notions is employed as the subject of a proposition, and a portion of the attributes which it comprehends is predicated of it, that predicate cannot properly be called Genus or Differentia, the comparison from which these distinctions arise having ceased.

With this proviso, we may adopt, *mutatis mutandis*, the classification of the Predicables given by Aristotle himself, as furnishing a more satisfactory groundwork than either the Isagoge of Porphyry or its subsequent scholastic embellishments. Every Proposition, according to Aristotle, expresses one of four relations of the Predicate to its Subject; Genus, (under which may be included Differentia,) Definition, Property, or Accident^o. For every Predicate must either be convertible with its Subject or not. If convertible, it either expresses the whole Essence (τὸ τῆς οὐσίας) of the Subject or not. In the former case it is called Definition, in the latter, Property. If not convertible, it either expresses part of the Essence or not. In the former case it is Genus, in the latter, Accident.

This division, being founded on dichotomy by contradiction, must necessarily exhaust every possible mode of Predication. Interpreting the Essence, in accordance with our present view, as the sum of the attributes comprehended in a notion, we shall find all four members admissible where the Subject of the proposition

^a This has been remarked by Leibnitz, *Nouveaux Essais*, iii. 3. p. 304, ed. Erdmann. *Schreiben an Wagner*, p. 425.

^o See Topics, i. 8. Sundry attempts have been made, not very successfully, to reconcile this account with that of Porphyry. But though some license of interpretation may be allowed, when the object is to reconcile an author with himself, it is scarcely necessary to strain his language into agreement with a writer who lived more than six centuries after him, and who does not even profess to be commenting on him.

has both *comprehension* and *extension*; i. e. is a complex notion containing attributes, and is predicable of existing objects. For its Predicate may either express a whole or a part of the attributes comprehended in the Subject, or else some attribute not so comprehended, but possessed by the objects of which the Subject is predicable. In the latter case, where the Subject and Predicate are distinct in comprehension, they may be either equal or unequal in extension.

The two first cases will correspond to the class of Propositions called by Kant, Analytical Judgments, and by Mr. Mill, Verbal Propositions. In these the attributes composing the Predicate are a part or the whole of those composing the Subject. They therefore depend solely on the principle of Identity. If Animal form part of the conception Man, the objects, whether actual or possible, thought under the latter must necessarily be identical with a portion of those thought under the former.

To avoid the introduction of new words, we may retain the Aristotelian nomenclature of Genus and Definition to express the relation of Predicate to Subject in these two classes of Propositions; though the former appellation, for the reason stated above, is not altogether free from objections. Under Definition may be also included a class of Propositions which are not in the strict sense of the word Analytical^p and are not admitted by Aristotle to be Definitions proper; viz. those in which the Predicate is a single term synonymous with the Subject.

The last two cases will correspond to the Synthetical Judgments of Kant, and to the Real Propositions of Mr. Mill. In these, the subject is neither a word nor a notion, but the several individual things of which

^p Though Kant admits even tautological propositions (A is A) as explicitly analytical.

a certain notion is predicable. For example, in the Proposition, "All men are mortal," we do not mean that the conception Man includes Mortality, but that the individuals possessing the attributes comprehended in the former notion possess also those comprehended in the latter.

In distinguishing a certain portion of these Propositions as predicating *Property*, we must divest ourselves altogether of the notion of necessary or contingent connexion, and regard the word purely as a translation of the Aristotelian *ἴδιον*. These Propositions assert, not merely that certain objects possess certain attributes, but that they alone possess them. This assertion, however, is very imperfectly expressed in the ordinary form of the affirmative proposition. The judgment, "all equilateral triangles are equiangular," does not by its mere form imply that all equiangular triangles are equilateral. This knowledge is conveyed by the geometrical matter, not by the logical form. To remedy this defect of language, it is necessary in a system of formal Logic to distinguish the propositions in which property is predicated from those in which accident is predicated, by attaching an universal sign to the predicate. "All equilateral triangles are all equiangular," will then denote that the predicate is a property of the subject; while "all men are some mortals," distinguishes by the particular sign that the predicate is an accident.

The distinction adopted by Aldrich between Property and Accident, as *necessarily* or *contingently* connected with the subject, is untenable in formal Logic. If not expressed in the copula, it implies the extralogical knowledge of a law of connection existing or not between the objects signified by the terms; a law which cannot be indicated in the symbolical form of the proposition.

If, on the other hand, a special form of the copula is adopted, and Property and Accident distinguished by the expressions, *A must be B*, *A may be B*, the classification becomes no longer applicable to the pure form of the proposition, and requires the introduction of the extra-logical doctrine of Modality¹. The adoption of a quantified predicate, on the other hand, is a necessary step when language is designed to express the pure form of thought, and every classification of logical forms should be adapted to this condition².

In the foregoing remarks, Genus and Definition express a relation of notions to notions, Property and Accident, one of attributes to things. Hence it will follow that notions purely imaginary, i. e. confessedly predicable of no objects existing elsewhere than in the mind, can only, as such, be the subjects of analytical judgments. Proper names, on the other hand, having no essence, can only be the subjects of synthetical judgments. The former have no Properties or Accidents; the latter have no Genus or Definition.

Species is excluded from the Predicables, and confined to the *Species Subjicibilis*, the correlative of the Predicable Genus. By this we avoid an inconsistency of which the majority of Logicians are guilty, in employing the term *Species* sometimes to express a relation of a Predicate to a Subject, sometimes that of a Subject to a Predicate. The so-called *Species Prædicabilis*, is, in the manner of its predication, in no way distinguishable from Genus. *Man*, when predicated of *philosopher*, expresses a part only of the essence of its subject, i. e. a portion of the attributes which the subject notion

¹ On Modality as a Form, see *Prolegomena Logica*, note G.

² This principle, the basis of Sir W. Hamilton's *New Analytic*, is well stated by Mr. Baynes, *Essay on the New Analytic*, p. 9.

comprehends; precisely as does *animal*, when predicated of *man*.

A Lowest Species will be inadmissible, as it implies a notion so complex as to be incapable of further accessions. It is true that, in the continual formation of Species, we may arrive at combinations of attributes not realised in Nature; but the classification of things is not the province of the Logician; nor has he a right to conclude *à priori* that the field of physical research is exhausted, or that notions now regarded as imaginary may not hereafter be discovered to be real. But whether such discovery be made or not, it will not affect the *relation* of two notions to each other. Logic is concerned only with the necessary relations of concepts in thought. Every concept being common to a plurality of objects, is potentially divisible into lower ones. A logical lowest species, if such were possible, would be a concept embracing all conceivable attributes not condemned by the laws of thought as contradictory of each other. This, as well as its opposite the logical highest genus, or notion so simple as to have no distinctive attributes, are mere imaginary limits, never reached in any process of actual thought*. A material science may have its highest and lowest classes, the former being the general class, embracing all the objects whose properties that science investigates; the latter the classes at which that special investigation ends. In Geometry, for example, under the *sumмум genus* of magnitudes in space, we find three *infimæ species* of triangles, the equilateral, the isosceles, and the scalene. The geometrical properties of the figures are not affected by any further subdivision. But this limitation cannot be acknowledged by the Logician. He knows nothing of the geometrical or

* See *Prolegomena Logica*, p. 183.

physical properties of this or that class of objects. As a mere concept, "an equilateral triangle whose sides are two feet long," is a subordinate species to equilateral triangle; and the subdivision may, as far as mere thought is concerned, be continued *ad infinitum*.

NOTE B.

ON THE CATEGORIES.

LISTS of the Categories, more or less complete, occur in different parts of Aristotle's works in slightly different relations. The following passages may be selected as the principal. *Categ.* ch. 4. Τῶν κατὰ μηδεμίαν συμπλοκὴν λεγομένων ἕκαστον ἥτοι οὐσίαν σημαίνει ἢ ποσὸν ἢ ποιὸν ἢ πρὸς τι ἢ ποῦ ἢ ποτέ ἢ κείσθαι ἢ ἔχειν ἢ ποιεῖν ἢ πάσχειν. Ἔστι δὲ οὐσία μὲν ὡς τύψι εἰπεῖν ὅλον ἄνθρωπος, ἵππος· ποσὸν δὲ ὅλον δῖπληχyu, τρῖπληχyu· ποιὸν δὲ ὅλον λευκόν, γραμματικόν· πρὸς τι δὲ ὅλον διπλάσιον, ἡμισυ, μείζον· ποῦ δὲ ὅλον ἐν Λυκείῳ, ἐν ἀγορᾷ· ποτέ δὲ ὅλον ἐχθρὸς, πέρυσιν· κείσθαι δὲ ὅλον ἀνάκειται, κάθεται· ἔχειν δὲ ὅλον ὑποδέδεται, ἀπλίσταται· ποιεῖν δὲ ὅλον τέμνει, καίει· πάσχειν δὲ ὅλον τέμνεται, καίεται. *Topic.* i. 9. Μετὰ τοίνυν ταῦτα δεῖ διορίσασθαι τὰ γένη τῶν κατηγοριῶν, ἐν οἷς ὑπάρχουσιν αἱ ρηθεῖσαι τέτταρες. Ἔστι δὲ ταῦτα τὸν ἀριθμὸν δέκα, τί ἐστι, ποσόν, ποιόν, πρὸς τι, ποῦ, ποτέ, κείσθαι, ἔχειν, ποιεῖν, πάσχειν. Ἄει γὰρ τὸ συμβεβηκὸς καὶ τὸ γένος καὶ τὸ ἴδιον καὶ ὁ ὀρισμὸς ἐν μιᾷ τούτων τῶν κατηγοριῶν ἔσται· πᾶσαι γὰρ αἱ διὰ τούτων προτάσεις ἢ τί ἐστιν ἢ ποιὸν ἢ ποσὸν ἢ τῶν ἄλλων τινὰ κατηγοριῶν σημαίνουσιν. *Metaph.* iv. 7. Καθ' αὐτὰ δὲ εἶναι λέγεται ὅσαπερ σημαίνει τὰ σχήματα τῆς κατηγορίας· ὅσαχῶς γὰρ λέγεται, τοσαυταχῶς τὸ εἶναι σημαίνει. Ἐπεὶ οὖν τῶν κατηγορουμένων τὰ μὲν τί ἐστι σημαίνει, τὰ δὲ ποιόν, τὰ δὲ ποσόν, τὰ δὲ πρὸς τι, τὰ δὲ ποιεῖν ἢ πάσχειν, τὰ δὲ ποῦ, τὰ δὲ ποτέ, ἐκάστῳ τούτων τὸ εἶναι ταῦτὸ σημαίνει.

From these passages it appears that the Categories were regarded by Aristotle, 1. As an enumeration of the different significations of simple terms, apart from their connexion in the proposition. 2. As an enume-

ration of the several genera under which Aristotle's four heads of predicables fall. 3. As an enumeration of the different modes in which Being may be signified. An examination of the principle of classification is necessary, in order that we may determine how far the charges of deficiency and redundancy, so frequently brought against Aristotle's list, are fairly tenable against it.

The most celebrated of these accusations is that of Kant*. Assuming that Aristotle's design was identical with his own, viz. to enumerate the pure or *à priori* conceptions of the understanding, he asserts that the classification was made upon no principle; that it was found by the author to be defective, and the post-predicaments added in consequence; that the list thus enlarged is still defective; that it contains forms of the sensibility as well as of the understanding; (*quando, ubi, situs, prius, simul*;) that empirical notions are intruded among the pure (*motus*), and deduced concepts classed as original (*actio, passio*); and that some original elements are altogether omitted^b.

A somewhat similar criticism is given in Mr. Mill's Logic. The Categories he supposes to be "an enumeration of all things, capable of being named; an enumeration by the *summa genera*, i. e. the most extensive classes into which things could be distributed; which therefore were so many highest Predicates, one or other of which was supposed capable of being affirmed with truth of every nameable thing whatsoever." Thus viewed, he pronounces the list to be both redundant and defective. Action, passion, and local situation, ought to be included under relation; together with position in time, (*quando*), and in space, (*ubi*); while the distinction

* For an account of the earlier criticisms of the Categories by Plotinus, Campanella, and others, see Trendelenburg, *Geschichte der Kategorienlehre*.

^b *Kritik der r. V.* p. 80. (ed. Rosenkranz.) *Prolegomena*, §. 39.

between the latter and *situs* is merely verbal. On the other hand, all states of mind are omitted entirely ; as they cannot be reckoned either among substances or attributes^c.

These objections will stand or fall, according as their authors have rightly or wrongly divined the purpose of Aristotle's classification. Kant is mistaken in supposing that Aristotle added the post-predicaments to complete his list of Categories. The post-predicaments were not so called by Aristotle, and have never been classed by commentators among the Categories. The term is of scholastic origin, and was employed to denote the five subjects treated of by Aristotle after the Categories proper. Kant is equally mistaken in supposing that Aristotle had any intention of classifying the pure forms of the understanding, independent of experience. On the contrary, the Categories belong to the matter of thought, are generalized from experience, and leave altogether untouched the psychological question of the existence of elements *à priori*^d. Any objection, therefore, based on the inclusion of empirical or the exclusion of original elements, is untenable, and rests on a misapprehension of the philosopher's design. Nor yet can we adopt Mr. Mill's opinion, that Aristotle designed a classification of all things capable of being named ; at least not in that point of view in which things are regarded according to their real characteristics as presented to consciousness. The Categories are rather an enumeration of the different modes of naming things, classified primarily according to the grammatical distinctions of speech, and gained, not from the observation

^c Mill's Logic, vol. i. p. 60.

^d See Sir W. Hamilton, *Edinburgh Review*, No. 99. p. 211. Franck, *Histoire de la Logique*, p. 26. St. Hilaire, *Logique d'Aristote traduite en Français*, Preface, p. lxxx.

of objects, but from the analysis of assertions. This is manifest from the name and from the manner of treatment. *Κατηγορία, κατηγορεῖν, κατηγορημα, κατηγορούμενον, κατηγορικός*, have all primarily reference to forms of speech; the term *κατηγορία* being used by Aristotle as well for any predicate term, as for the highest generalizations under which predicates can be classed^f. In the beginning of the treatise on the Categories, terms as combined in a proposition are made to precede terms regarded separately^g; and the proposition, as the only assertion capable of truth and falsehood, appears to be regarded as the unit of speech, of which the simple term is but a fractional element^h.

It is therefore probable, that the Aristotelian distinction of Categories arose from the resolution of the proposition and a classification of the grammatical distinctions indicated by its parts. The noun substantive leads us to the category of *οὐσία*, the adjectives of number and of quality to *ποσόν* and *ποιόν*, the adjective of comparison to *πρός τι*, the adverbs of place and time to *ποῦ* and *πότε*, the different forms of the verb, intransitive, præterite, active, and passive, to *κείσθαι*, *ἔχειν*, *ποιεῖν*, and *πάσχειν*ⁱ. It is true that in his subsequent treatment the philosopher by no means adheres strictly to the grammatical point of view, and that his classification may, even on his own principles, be considerably simplified; but it must be remembered, that at that time the science of Grammar was in its infancy, that its forms of speech had not been analysed completely, nor its boundaries clearly separated from those of Logic and Metaphysics.

^f See Trendelenburg, *Geschichte der Kategorienlehre*, p. 2. The Aristotelian expression *σχήματα τῆς κατηγορίας* will thus primarily mean *forms of predication*.

^g See *Categ.* ch. 2.

^h See *Categ.* ch. 3. Trendelenburg, *Kategorienlehre*, p. 12.

ⁱ Trendelenburg, *Elementa*, §. 3. *Kategorienlehre*, p. 23.

The omission, therefore, in the Aristotelian list, of separate heads of classification for mental states, cannot be charged as a defect in this point of view, so long as mind and its various states (whatever may be their difference in other respects) are represented by the same verbal forms as substances and attributes. And accordingly we find various mental states, faculties, passions, habits, and dispositions, classified together with corresponding affections of body, under the head of qualities^k. A more valid objection in a grammatical point of view would be, that qualities in their abstract form are expressed by nouns substantive, and should therefore be classed under the category of substance. This objection would be tenable in relation to the distinctions of modern Grammar. But Aristotle appears to have limited the *substantive word* to terms expressive of the *πρῶται οὐσίαι*, or individual substances, and the *δεύτεραι οὐσίαι*, or their several genera and species. The latter denote properly the category of substance, or substance considered as one of the possible predicates of a proposition. Words denoting individual substances, being subjects only in the proposition, do not properly indicate a category^l.

In reference, therefore, to the treatise of the same name, we might fairly describe the Aristotelian Categories as an enumeration of the different grammatical forms of the possible predicates of a proposition, viewed in relation to the first substance as a subject. And this view is not materially departed from in the other writings of Aristotle. The passage quoted from the Topics, indeed, only continues the same view, stating that those predicates, which in their actual relation to their subjects in a proposition

^k See Categ. ch. 8.

^l Categ. 5. 27. 'Ἀπὸ μὲν γὰρ τῆς πρώτης οὐσίας οὐδεμία ἐστὶ κατηγορία· κατ' οὐδενὸς γὰρ ὑποκειμένου λέγεται· τῶν δὲ δευτέρων οὐσιῶν τὸ μὲν εἶδος κατὰ τοῦ ἀτόμου κατηγορεῖται, τὸ δὲ γένος καὶ κατὰ τοῦ εἶδους καὶ κατὰ τοῦ ἀτόμου.

come under one of the four heads of Genus, Definition, Property, or Accident, come as simple terms under one of the ten Categories. The Metaphysical view of the Categories is not materially different. In that work, Aristotle enumerates the different senses in which the term *Being* (τὸ ὄν) is used, in order to determine in what sense it is applied to the object of metaphysical inquiries^m. *Being* sometimes signifies the accidental connection of an attribute with a subject, or of two attributes with a common subject. It is also used co-extensively with the Categories in predication; thus we may say, ἄνθρωπος ὑγιαίνει, or ἄνθρωπος ὑγιαίνων ἐστίν, ἄνθρωπος τέμνει, or ἄνθρωπος τέμνων ἐστίν, the verb εἶναι being admissible as a copula in any proposition, whatever may be the category of its predicateⁿ. But substance is the πρῶτως ὄν, the proper object of metaphysics^o. In this account, Aristotle does not appear to have distinguished between the verb substantive, as denoting real existence, and the copula as denoting the coexistence of notions in the mind; but, as in other places, the Categories are enumerated, not as an exhaustive catalogue of existing things, but as a list of different modes of predicating by the copula. They thus originally belong to Grammar, rather than to Logic or Metaphysics, though the treatment of later philosophers, perhaps in some degree sanctioned by Aristotle himself, has brought them into closer connection with the latter sciences, and overlooked their proper relation to the former^p.

^m See Trendelenburg, *Kategorienlehre*, p. 167.

ⁿ Metaph. iv. 7.

^o Metaph. vi. 1.

^p Trendelenburg, *Kategorienlehre*, p. 216.

NOTE C.

ON DEFINITION.

IN the notes to Aldrich's account of Definition, I have endeavoured to explain his language in conformity with the views most commonly found in Logical Treatises. But as these views differ in many respects from those of Aristotle, on which they are supposed to be founded, and as a correct account of the doctrines of that Philosopher will materially assist in the solution of more than one of those *vexatæ quæstiones* which are most perplexing to beginners in Logic, I shall attempt a somewhat fuller exposition here.

In the second Book of the Posterior Analytics, Aristotle mentions three different forms of Definition, in the following words: "Ἔστιν ἄρα ὁρισμὸς εἰς μὲν λόγος τοῦ τί ἐστιν ἀναπόδεικτος, εἰς δὲ συλλογισμὸς τοῦ τί ἐστι, πτώσει διαφέρων τῆς ἀποδείξεως, τρίτος δὲ τῆς τοῦ τί ἐστιν ἀποδείξεως συμπέρασμα". This passage is a concise summary of the whole Aristotelian theory of Definition. Adopting it as our text, we proceed to comment as follows.

A necessary preliminary to the determining the Real Definition of any object, (τί ἐστι,) is to ascertain that such object exists (ὅτι ἔστι). Otherwise our Definition will be merely a nominal one^b. But we have two classes of definable objects, of which the existence is determined in two different ways, producing a corresponding variety in the form of the Definition.

^a Anal. Post. ii. 10. 4.

^b Anal. Post. ii. 8. 8. 'Ἀδύνατον εἰδέναι τί ἐστιν, ἀγνοοῦντας εἰ ἔστιν. Ibid. ii. 7. 2. 'Ἀνάγκη γὰρ τὸν εἰδῶτα τὸ τί ἐστιν ἄνθρωπος ἢ ἕλλο οἰοῦν, εἰδέναι καὶ ὅτι ἔστιν· τὸ γὰρ μὴ ὃν οὐδεὶς οἶδεν ὅ τι ἐστίν, ἀλλὰ τί μὲν σημαίνει ὁ λόγος ἢ τὸ ὄνομα, ὅταν εἴπω τραγέλαφος, τί δ' ἔστι τραγέλαφος ἀδύνατον εἰδέναι.

I. Attributes, under which term are included all things belonging to any other Category than that of Substance. These exist only in Substances as their subjects, and their existence is properly determined by *Demonstration*^c. When ascertained in any other way, we are said to know it only accidentally^d. In the Demonstrative Syllogism, the minor term is the Subject, the major the Attribute; the Cause, by virtue of which the Subject is thus affected, being the middle term. When by such a Syllogism we have proved that all A is B, we know that the attribute B exists in the subject A.

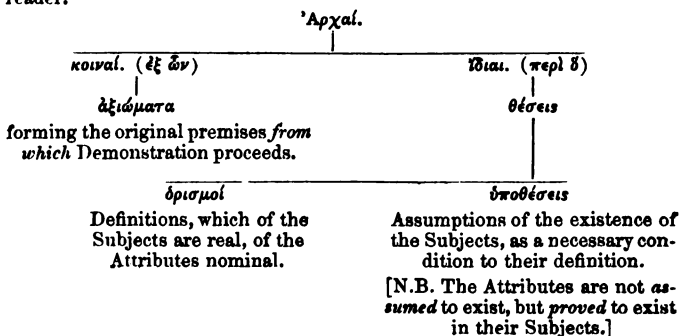
II. Substances, which exist not in a Subject, but *per se*^e. Of such the existence cannot be proved, but must be *assumed*, before any of their Attributes can be demonstrated. This assumption, under the name of Hypothesis, forms one of the Aristotelian ἀρχαί, or Principles of Science, which must precede all Demonstration^f.

^c Hence the Scholastic maxim, *Accidentis esse est inesse*. Cf. Aquinas, Opusc. xlviii. de Syll. Demonst. ch. 11. I have preferred the term Attribute to Accident, inasmuch as the latter is frequently appropriated in a special sense to such Attributes as exist only contingently, and are therefore indemonstrable.

^d Eth. Nic. vi. 3. 4. ὅταν γὰρ πως πιστεύῃ καὶ γνώριμοι αὐτῷ ᾧσιν αἱ ἀρχαί, ἐπίσταται· εἰ γὰρ μὴ μᾶλλον τοῦ συμπεράσματος, κατὰ συμβεβηκὸς ἔξει τὴν ἐπιστήμην.

^e Categ. 5. 18. Κοινὸν δὲ κατὰ πάσης οὐσίας τὸ μὴ ἐν ὑποκειμένῳ εἶναι.

^f The following table of the Principles of Science may be useful to the reader.



In some passages, speaking in a stricter sense, Aristotle declares Substances alone to be capable of Definition^a; but in the wider sense of the term which prevails throughout the Posterior Analytics, it is applicable both to Substances and to Attributes. In both cases the inquiry into the Definition of a thing is identical with that into its cause; with this distinction, that in the case of Attributes, the Cause is to be sought, not in the Attribute, but in its Subject; whereas in the case of Substances which exist *per se*, the Cause is to be sought in themselves only^b.

Attributes are defined by the same cause which served as a middle term to prove their existence. This is the mode of Definition described as συλλογισμὸς τοῦ τί ἐστι, πτώσει διαφέρων τῆς ἀποδείξεως. As an example, he gives the definition of an eclipse. The moon is proved to be eclipsed, because the sun's light is intercepted by the earth. The same cause furnishes us at once with a middle term for demonstration, and with a definition of the attribute^c. Why is the moon eclipsed? Because

See Anal. Post. i. 2. 7. i. 10. 1. i. 32. 6. and Sanderson's Logic, b. iii. ch. 11. From this it will be seen that Mr. Mill has unjustly accused Aristotle of maintaining that the science of Geometry is deduced from Definitions. (Mill's Logic, vol. i. p. 197.) Hence may also be explained the contradiction which Stewart professes to find in Aristotle's doctrines. (Elements, Pt. ii. ch. 3. sect. i.) The principles from which Aristotle demonstrates, are *Axioms*, of which he gives as a specimen, "If equals be taken from equals, the remainders are equal." The necessity of *assuming* the existence of the subject is maintained by Aristotle as clearly as by Mr. Mill. Cf. also Metaph. v. 1. 2. x. 7. 2.

^a e. g. Metaph. vi. 5. 5. Cf. Metaph. vi. 4. 12.

^b Anal. Post. ii. 2. 5. ὥσπερ οὖν λέγομεν, τὸ τί ἐστιν εἶδέναι ταὐτὸ ἐστὶ καὶ διὰ τί ἐστιν. Τοῦτο δ' ἡ ἀπλῶς καὶ μὴ τῶν ὑπαρχόντων τι, ἢ τῶν ὑπαρχόντων. Anal. Post. i. 24. 6. ᾧ γὰρ καθ' αὐτὸ ὑπάρχει τι, τοῦτο αὐτὸ αὐτῷ αἴτιον.

^c The reduction of this Demonstration to syllogistic form has been variously attempted. The following is given by Aquinas, Opusc. 38. "Omne corpus naturale, illuminatum a sole, privatum luce a terræ objectu deficit; luna est hujusmodi, ergo luna deficit." A more general, and so far preferable, major premise, is given by Crakanthorpe, Log. lib. iv. cap. 4.

the sun's light is intercepted by the earth. What is an eclipse? An intercepting of the sun's light from the moon by the earth. Thunder in the same way is defined, *ἀπόσβεσις πυρός ἐν νέφει*, the answer to the question *διὰ τί βροντᾷ*; being *διὰ τὸ ἀποσβένυσθαι τὸ πῦρ ἐν τῷ νέφει*.

This kind of definition, as has been observed, differs from a demonstration in the position (*θέσις*) of its terms¹; for it has the same terms (*ἔκλειψις*, *ἀντίφραξις*, *σελήνη*,—*βροντή*, *ἀπόσβεσις πυρός*, *νέφος*,) but not in the same order, and with some variety of grammatical form (*πτῶσις*²).

The Definition, then, of an Attribute is to be found in its Cause. But the Aristotelian Philosophy recognises four Causes, and sometimes more than one of these is concerned in the production of the same effect. Which of these is to be taken as the Definition? In Anal. Post. ii. 11. Aristotle shews that any one of the four may be used as a middle term in demonstration; but it by no means follows that each may be a Definition of the major term. On this point, Aristotle's opinion is not decidedly

"Omne corpus illuminatum ab alio, inter quod et corpus illuminans, opacum corpus sic interponitur, ut umbra opaci corporis operiat et comprehendat corpus illuminatum, eclipsatur seu privatur suo lumine."

¹ The Definition is by some given as "an obscuration of light in the moon, caused by the interposition of the earth." But in this case, the major term of the Demonstrative Syllogism is not "eclipsed," but "obscured." If these two terms are synonymous, the Definition is merely nominal, and the latter part superfluous; if not, we do not define the attribute demonstrated (obscuration), but another (eclipse), contained under it as species under genus. I interpret Aristotle's words as referring to the complex form of the Definition, as given in question and answer, or in a proposition—*τί ἐστιν ἔκλειψις*; *ἀντίφραξις ὑπὸ γῆς*· ἢ *ἔκλειψις ἐστὶν ἀντίφραξις ὑπὸ γῆς*. So the third form of Definition mentioned An. Pr. ii. 10. resembles the conclusion of a Demonstration, as containing, in the same form, only the major and minor terms, (*βροντή*, *νέφος*) ἢ *βροντή ἐστὶ ψόφος ἐν νέφει*. Aristotle's text is not decisive, the one view being rather supported by ch. 8. the other by ch. 10. The question is by no means unimportant; the attempt to reduce these Definitions to a pseudo-Genus and Differentia has fostered a grave error, which will be noticed hereafter.

² Pacius and Waitz consider *πτῶσις* and *θέσις* to be synonymous.

expressed; but it seems probable that he regarded the *formal cause* only as available for the purposes of Definition. For a material cause, properly speaking, has no place in attributes, but only in physical substances¹; and that which in the former is most nearly analogous to matter, viz. the necessary condition out of which the effect arises, may in such cases be identified with the formal cause. This Aristotle allows in the chapter in question, when he states that the material cause there instanced as a middle term is in fact the same as the formal^m. The efficient and final causes seem to be excluded, as not being contemporaneous with their effects, so that from the existence of the one we cannot certainly infer that of the otherⁿ. Whereas the formal cause is expressly distinguished as τὸ τί ἦν εἶναι^o; and the examples given of it in Anal. Post. ii. 12. 1. correspond exactly to those previously given as Definitions. The other causes only accidentally serve the same purpose, in those instances in which they coincide with the formal^p.

¹ Metaph. vii. 4. 6. Περὶ μὲν οὖν τὰς φυσικὰς οὐσίας καὶ γεννητὰς ἀνάγκη οὕτω μετείναι, εἴ τις μέτεισιν ὁρθῶς, εἴπερ ἔρα αἰτιά τε ταῦτα καὶ τοσαῦτα, καὶ δεῖ τὰ αἰτία γνωρίζειν. Ἐπὶ δὲ τῶν φυσικῶν μὲν αἰδίων δὲ οὐσιῶν ἄλλος λόγος. Ἴσως γὰρ ἕνα οὐκ ἔχει ὕλην, ἢ οὐ τοιαύτην ἀλλὰ μόνον κατὰ τόπον κινήτην. Οὐδ' ὅσα δὴ φύσει μὲν μὴ, οὐσίᾳ δέ, [sc. ὑπάρχει] οὐκ ἔστι τούτοις ὕλη ἀλλὰ τὸ ὑποκείμενον ἢ οὐσία. Ὅσον τί αἰτίον ἐκλείψεως, τίς ὕλη; οὐ γὰρ ἔστιν, ἀλλ' ἡ σελήνη, τὸ πάσχον.

^m See Anal. Post. ii. 11. 3.

ⁿ See Anal. Post. ii. 12. 3, 4. and Waitz, Org. vol. ii. p. 411.

^o Anal. Pr. ii. 11. 1. Metaph. i. 3. 1.

^p See Rassow, "Aristotelis de Notionis Definitione Doctrina," p. 16. A very different view has been taken by some Logicians. Crakanthorpe, for example, maintains that Demonstration can only be, "a causa efficiente per emanationem, vel a causa efficiente per externam actionem, vel a causa finali;" and he devotes a chapter to shewing that neither the Material nor the Formal cause can be a middle term in Demonstration, though the efficient cause of the Attribute may be the formal cause of the Subject. A similar view is maintained by Sanderson, lib. iii. cap. 15.

We have next to consider the Definitions of Substances. Here too the investigation of cause is the root of the whole inquiry; but the manner in which it is conducted is not at first sight so obvious as in the former case. To ask the cause of an attribute, is to ask why the subject is so affected. Why, for example, is the moon eclipsed? But what is meant by the *cause* of a man, and in what form will the question be proposed? To ask why man exists, is in fact to ask why there are such beings in the world,—a question admitting only of Grangousier's solution[†],—and, when so solved, contributing nothing towards the Definition. To ask why a man is a man, is, as Aristotle himself observes, futile[‡]. The only form in which the question can be put is, Why is this or that individual a man? What are the essential constituents of the notion Man, the possession of which entitles Socrates to be reckoned in the class? Here too the formal cause determines the Definition.

These Definitions form the first of the three kinds distinguished in Anal. Post. ii. 10. 4. "Ἔστιν ἄρα ὁρισμὸς εἰς μὲν λόγος τοῦ τί ἐστὶν ἀναπόδεικτος. These Definitions are assumed prior to all demonstration[§], and are real, inasmuch as the existence of the objects is assumed with them. The ground of the assumption will vary according to the nature of the object to be defined^{||}.

With regard to the third class of definitions, described as τῆς τοῦ τί ἐστὶν ἀποδείξεως συμπέρασμα, Commentators

But to support this interpretation requires considerable straining of Aristotle's language.

[†] Tristram Shandy, vol. iii. ch. 41. see also Rabelais, liv. 1. ch. 40.

[‡] Metaph. vi. 17. 2. τὸ μὲν οὖν διὰ τί αὐτό ἐστιν αὐτό, οὐθέν ἐστι ζητεῖν.

[§] Anal. Post. ii. 9. 1. ὥστε δῆλον ὅτι καὶ τῶν τί ἐστι τὰ μὲν ἡμεῖς καὶ ἀρχαί εἰσιν, ἃ καὶ εἶναι καὶ τί ἐστὶν ὑποθέσθαι δεῖ ἢ ἄλλον τρόπον φανερά ποιῆσαι.

^{||} Metaph. x. 7. 2. λαμβάνουσι δὲ τὸ τί ἐστὶν αἱ μὲν [ἐπιστῆμαι] διὰ τῆς αἰσθήσεως αἱ δ' ὑποτιθέμεναι διὰ καὶ δῆλον ἐκ τῆς τοιαύτης ἐπαγωγῆς ὅτι τῆς φύσεως καὶ τοῦ τί ἐστὶν οὐκ ἔστιν ἀπόδειξις.

are at issue, whether they are to be regarded as nominal, or as imperfect real definitions^a. The question is of the less importance, inasmuch as Aristotle elsewhere condemns the use of such definitions altogether². The weight of authority is perhaps with the latter interpretation. But, judging merely from the text of Aristotle, the former seems far simpler and more natural⁷.

From the above statement it would appear that Nominal Definition, according to Aristotle, is one in which there is no evidence of the existence of objects to which the definition is applicable. In form it need not necessarily differ from a Real Definition. There may be a quasi-genus and a quasi-difference, as if we defined a centaur, "an animal with the upper parts of a man and the lower parts of a horse;" but, until we have ascertained the existence of creatures possessing these characteristics, the definition is only one of the signification of a name².

^a Of the former opinion are Averroes and Zabarella, who are followed by M. St. Hilaire in his Translation of the Organon. The latter is maintained by the Greek Commentators, by Pacius, and in the recent Essays by Rassow and Kühn.

² See De Anima, ii. 2. 2.

⁷ The decision partly depends on the interpretation of a doubtful passage, Anal. Post. ii. 8. 4. τὸ δ' εἰ ἔστιν ὅτε μὲν κατὰ συμβεβηκὸς ἔχομεν, ὅτε δ' ἔχοντές τι αὐτοῦ τοῦ πρῶτου. The instances which follow may refer either to the one or the other.

² It may be questioned whether the name Nominal Definition is sanctioned by Aristotle. Trendelenburg indeed (Elementa, §. 55.) so renders the λόγος ὀνοματώδης of An. Post. ii. 10. 1. and the interpretation, if correct, would seem to shew that Nominal, as well as Real Definitions must be sentences; but the context, λόγος τοῦ τί σημαίνει τὸ ὄνομα ἢ λόγος ἕτερος ὀνοματώδης, seems rather to mean, "a sentence explanatory of the signification of a name, or of another sentence having the force of a name." On the other interpretation, the word ἕτερος is superfluous, and the example, ὅλον τὸ τί σημαίνει τί ἔστιν ἢ τρίγωνον, unintelligible. By λόγος ὀνοματώδης is therefore meant a sentence whose signification, like that of a single noun, is one. Such are all real Definitions, of which the example is a specimen. See De Int. 5. 2. Metaph. vi. 4. 16. vi. 12. 2. vii. 6. 2. Alex. Schol. p. 748. a. 31. In the Greek Commentators, on the other hand, λόγος ὀνοματώδης is clearly used for Nominal Definition. See Philop. Schol. p. 244. b. 31.

There is also no warrant in Aristotle for limiting the means by which Nominal Definition may be effected; as is done by those Logicians who specify synonyms and etymologies. The latter method indeed seems to have trespassed on the domain of Logic from that of Rhetoric. Nor has it the slightest connection with the former, save by an ambiguity of language. The etymology will in nine cases out of ten declare, not the present meaning of the word, but either one that has become obsolete, or some secondary notion, which may account for the imposition of the name, but which at no time formed, strictly speaking, any part of its signification. This holds equally of real objects and imaginary. It is only by an equivocation that "bull-piercer" can be assigned as the *meaning* of "centaur," or the notions of a swine and a quickset fence be combined into that of "hedgehog."

Definition by synonym, on the other hand, may be one of the means of explaining the signification of a name; though relatively only, and from the accidental circumstance of one word being more familiar to the hearer than another; in which respect all translations from one language into another are equally nominal definitions. It is not, however, specially mentioned by Aristotle*. As a real definition it is obviously inadmissible, as it neither assigns the cause of a phenomenon nor develops the contents of a notion.

The above data will also furnish us with an answer to a question, which, latterly at least, has been a sore puzzle to the tyro in Logic. What are the limits of Definition? If all real Definition must be by Genus and Differentia,

* Synonyms are expressly denied to be real Definitions in the proper sense by Aristotle, Top. I. 5. 1. though admitted to be *ὀνόμα*. As Nominal Definitions, they are allowed by Alexander on Metaph. vi. 4. p. 442. ed. Bonitz; but the genuineness of this portion of the Commentary has been questioned.

the object defined must in every case be a *Species*. Summa Genera and Individuals are in that case alone indefinable. And for this limitation, the authority of Aristotle may be cited. On the other hand, Locke^b assures us that this restriction is erroneous, and that *Simple Ideas* alone are incapable of Definition^c. The dispute may be reduced to a mere verbal question. For Aristotle does not maintain that all Definitions must be by Genus and Differentia, but only those of Substances. In the passages which seem to extend this rule, Definition is used in the narrow sense which has been previously mentioned^d. For it is obvious, to take the instances adduced above, that "quenching" cannot be called the genus of "thunder," or "interception" of "eclipse," in the same

^b Essay, b. iii. 4. 7. But Locke has in this matter been anticipated by Descartes, Princip. i. 10. Sir W. Hamilton (Reid's Works, p. 220.) maintains that Aristotle has said the same thing. It is dangerous to dispute any thing which a man of Sir William's learning professes to have discovered in so wide a field as Aristotle, especially as he gives no references; but if the passage alluded to be Metaph. vi. 17. 7. one might be tempted to hazard a different interpretation. Τὰ ἀπλά seem rather to be the elements, (ἀπλά σώματα, Met. vii. 1. 2.) which have not, like compound substances, received a definite form, and thus are not definable. Cf. Plato, Theæt. p. 205. c. But the words are not sufficiently decisive to furnish much ground for any theory. A more remarkable passage occurs in Occam's Logic, Pt. i. ch. 23. "Ex prædictis sequitur quod nulla intentio quæ est præcise communis rebus simplicibus carentibus compositione ex materia et forma habet differentias essentielles; quia non habet partes, quamvis possit habere multas differentias accidentales. Ex illo sequitur ulterius quod nulla species quæ est præcise simplicium est definibilis definitione proprie dicta, sive sit in genere substantiæ sive in quocunque alio prædicamento." This, coupled with Occam's Conceptualist theory of Universals, is not very different from Locke's position concerning Simple Ideas.

^c By Simple Ideas, Locke meant all ideas derived immediately from sensation or reflection. In the formation of these the mind is wholly passive, whereas in the formation from them of Complex Ideas, it is active. Among Simple Ideas derived from sensation, he enumerates solidity, space, figure, rest, and motion; from reflection, perception and volition; from both, pleasure and pain.

^d As, for example, Topics i. 8. 3. Compare Metaph. vi. 4. 12, 16. vi. 5. 5. and Alex. in Metaph. p. 442. 30. ed. Bonitz.

sense as "animal" is of "man." Whereas Locke's simple ideas are exclusively ideas of attributes. By reference then to Aristotle's account of the latter, it will plainly appear that he and Locke mean two very different things by Definition. With the former, it is an investigation of the objective cause of a phenomenon; with the latter, an analysis of the subjective impression which that phenomenon produces in the mind. The *idea* of an interception of light is not part of the *idea* eclipse, but the one phenomenon is the physical antecedent and cause of the other. Inquiries of this kind are still classed among the most important problems of Physical Science. What, for example, is light? Is it a succession of material particles, or the undulations of an elastic medium? The solution of this question would not be a Definition in Locke's sense of the word; i. e. it would not be an analysis of the idea of light produced in the mind by sensation. The same may be said of colour. The mental sensation of whiteness or redness is altogether unaffected by the researches of Optics. The external cause of colour, regarded as a quality of bodies, falls directly within the province of the Science*. The determination of such problems will be, in Aristotle's sense of the term, Definition.

This may be further illustrated by reference to a discussion of Aristotle's which few probably have perused for the first time, without considering it as singularly vague and unsatisfactory. I mean the dissertation on Pleasure, in the tenth Book of the Nicomachean Ethics. We are struck with the absence of any thing like a Definition or Analysis of the emotion; and a reader who commences the study of the book with some previous knowledge of Locke's theory of Simple Ideas, will probably be disposed to regard it as an attempt to define

* Compare on this subject, Reid, Inquiry, ch. vi. sect. 5.

that which is incapable of definition, and which in consequence necessarily involves its own failure. The same may be said of the principal opinion which Aristotle controverts. Whether we regard Pleasure with Plato, as consisting in a motion towards a natural state of harmony, or with Aristotle, in the perfect exercise of a power; neither of these can be termed an explanation of the feeling itself, but only of the cause by which it is produced. Pleasure itself remains an indefinite something, consequent on the one or the other. Yet examined according to Aristotle's own view of the definition of attributes, we see that pleasure is as fairly defined by the perfection of the energy, as an eclipse by the interception of light¹.

There are, however, conditions and limits to the definitions of Attributes, though they are not the same as those of Substances. Every Substance to be definable must be a *Species*. Every Attribute must be a *Property*, i. e. must be capable of demonstration by its cause. Accidents then, as merely contingent attributes, are incapable of definition. This limitation, however, is merely relative to the degree of our knowledge of the matter. The advance of Science may transform Accidents into Properties, and thus furnish the requisite means of definition.

Before concluding the subject, it will be necessary to say a few words on two other points connected with Aristotle's doctrine of Definition.

¹ Leibnitz adopts the same view as Aristotle, observing that pleasure admits of a *causal*, though not of a *nominal* definition. *Nouveaux Essais*, ii. 21. §. 46. In another point of view, simple ideas admit of a definition by logical analysis; viz. when they are considered not as phenomena presented to the sense, to be resolved into simpler sensible phenomena, but as concepts, or general notions, representative of objects of thought, to be resolved into simpler concepts. On this distinction I have remarked elsewhere. See *Prolegomena Logica*, p. 45.

The first of these is his method of investigating, or, as he terms it, *hunting for*, the Definition. This may be effected in two ways, commonly called the methods of Division and Induction. The first of these consists in taking a wide Genus, under which the object to be defined is evidently included, and contracting it by the addition of successive differentia, till we obtain a complex notion coextensive with that of which the Definition is sought. Of the notion thus obtained, each separate part is more extensive than that which is to be defined, though the whole is not so*. A good example of this method is given by Cicero, *Topica*, c. 6. "Sic igitur veteres præcipiunt: cum sumseris ea, quæ sint ei rei, quam definire velis, cum aliis communia, usque eo persequi, dum proprium efficiatur, quod nullam in aliam rem transferri possit. Ut hoc, Hereditas est pecunia. Commune adhuc: multa enim genera sunt pecuniæ. Adde quod sequitur: quæ morte alicujus ad quempiam pervenit. Nondum est definitio: multis enim modis sine hereditate teneri mortuorum pecuniæ possunt. Unum adde verbum, jure: jam a communitate res disjuncta videbitur, ut sit explicata definitio sic: Hereditas est pecunia, quæ morte alicujus ad quempiam pervenit jure. Nondum est satis: adde, nec ea aut legata testamento, aut possessione retenta: confectum est."

* Anal. Post. ii. 13. 3. Τὰ δὲ τοιαῦτα λεπτέον μέχρι τούτου, ἕως τοσαῦτα λεπτῆς πρώτων, ὧν ἕκαστον μὲν ἐπὶ πλεῖον ὑπάρξει, ἅπαντα δὲ μὴ ἐπὶ πλεον ταύτην γὰρ ἀνάγκη οὐσίαν εἶναι τοῦ πράγματος. Yet in the *Metaphysics* (vi. 12.) he seems to maintain that the last differentia must be coextensive with the subject; a view generally adopted by the Scholastic Logicians, though manifestly inconsistent, not only with the passage above quoted, but with the example appended, τὸ δὲ τελευταῖον καὶ τῇ ὀνόματι. In the *Metaphysics* however he seems to be speaking, not of the specific difference *per se*, but of the difference regarded as dividing the genus. But this is in fact equivalent only to saying that the whole must be coextensive; which no one would think of denying.

This method was a favourite with Plato; it was rejected as useless by Speusippus^b. Aristotle adopts an intermediate course, limiting, however, its utility chiefly to two points,—the right arrangement of the several parts of the Definition, and the security that nothing essential is omitted. It would thus seem to be useful, not so much for *discovering* Definitions as for *testing* themⁱ; and even in this respect will be applicable only to one class of Definitions, that of Substances by genus and differentiæ.

For discovery, the second method is employed. This is commonly called the Inductive Method; a name, however, not sanctioned by Aristotle himself^j. It consists in examining the several individuals of which the term to be defined is predicable, and observing what they have in common. If we can obtain one common notion, that is the Definition sought; if not, the object of inquiry is not one but many. This method is equally applicable to Substances and to Attributes, though Aristotle only gives an example of the latter, the definition of magnanimity, gained by examining into the actions of different magnanimous persons.

Another important remark of Aristotle's is, that although, as we have already seen, demonstration, in certain cases, must always precede definition, yet no definition, as such, can be proved. This he maintains at some length (against Xenocrates^k), in Anal. Post. i. 4. and shews that

^b See Scholia, p. 179. b. 40. 248. a. 11.

ⁱ This is perhaps marked by Aristotle's own language. In reference to the one method, he uses *κατασκευάζειν*; to the other, *ζητεῖν*.

^j Aristotle does not give any name to the process; by his Commentators it has been variously denominated the method of Resolution, of Composition, of Induction. Cf. Edinburgh Review, No. 115. p. 236. Zabarella, Logic, p. 1212. Pacius on Anal. Post. ii. 13. 21.

^k Scholia, p. 242. b. 35. Trendelenburg, de An. p. 273. Kühn, de Notionis Definitione, p. 11.

every attempt at such demonstration necessarily involves a *petitio principii*. The reason is obvious: since a definition can be predicated essentially (ἐν τῷ τῷ ἑστῇ) of nothing but that of which it is a definition; and since, to prove a conclusion concerning the essence, the premises must be of the same character; the middle term assumed must be identical with the minor, and the major premise with the conclusion.

Such is Aristotle's Theory of Definition. Its fundamental principle may still, *mutatis mutandis*, be retained, notwithstanding that the speculations of modern philosophy have considerably modified his distinctions of Substances and Attributes. Properly speaking, indeed, all Definition is an inquiry into *Attributes*. Our complex notions of Substances can only be resolved into various Attributes, with the addition of an unknown *substratum*:—a something to which we are compelled to regard these Attributes as belonging¹. *Man*, for example, is analysed into Animality, Rationality, and the something which exhibits these phenomena. Pursue the analysis, and the result is the same. We have a something corporeal, animated, sensible, rational. An unknown constant must always be added to complete the integration; unfortunately we have no means of determining its value. Still, this does not affect the basis of the Aristotelian distinction. For some phenomena can be accounted for by other phenomenal causes; in others, we must acquiesce in the conviction that they are so, merely because they are. It is clearly impossible for the mere hypothesis of an unknown substratum to explain the reason of all the variety of attributes which different objects exhibit.

One further question remains. How far Definition properly belongs to the province of Logic, was, as we

¹ Cf. Locke, *Essay*, book ii. ch. 23.

have seen, an early point of dispute among the Schoolmen^m. On this question the authority of Aristotle is of little avail for either side. That his treatment of the subject has far more of a material than a formal character is undeniable. And to those who maintain that the *Organon* of Aristotle is designed as a systematic treatise on a single subject called Logic, such testimony must be decisive as regards both the material character of much of the Science, and its inclusion of Definition. But then it remains, and probably will continue to remain, a problem, to frame a conception of Logic adequate to the province thus assigned to it. This question has been already treated of in the Introduction, and need not be repeated here. It is sufficient to say that, as far as any evidence is furnished, either by the writings of Aristotle himself or by external testimony as to their original connexion, it is no more a departure from the authority of the Stagirite to assign a field to Logic incommensurate with that of the *Organon*, than it is to write a moral treatise on the basis of the *Ethics*, without including the *Politics*. Leaving then the question of authority, we may fairly assert that Logic as a formal Science can take no cognisance of the following points.

I. It has nothing to do with determining the physical existence of attributes in their subjects; which is in fact an inquiry into the *material truth* of the propositions in which such attributes are predicated. It is true that such propositions are by Aristotle considered as the conclusions of Syllogism, and so far their truth is merely formal. But it must be remembered, that no attribute can be syllogistically demonstrated of one subject, without being in the premise asserted of another; and it is upon the material truth of the latter proposition that the certainty of the

^m See p. 39, note c.

former, and the demonstrative character of the whole reasoning, ultimately depends.

II. Logic has nothing to do with testing the material *correctness* of a definition, i. e. ascertaining how far the notions developed in our analysis of a given concept correspond to the principal phenomena exhibited by the objects usually included under that concept; nor even with the inquiry, whether our usage of terms corresponds with the ordinary language of others.

III. Still less does it lie within the province of Logic to perform the functions either of a Dictionary or of an Index to Physical Science; to convey, that is, information from without, whether concerning the meaning of words or the nature of things, into a mind previously ignorant. Whereas from the statements of some Logicians, one might almost imagine that they regarded their Science as furnishing, as it were, Logarithmic Tables of things in general; Catalogues of Genera and Differentiæ, to which we have only to refer any given object, to obtain full information concerning it^a.

These being excluded, the only office that remains for Logic to perform, is to contribute to the *distinctness* of a given concept, by an analysis and separate exposition of the different parts contained within it. This operation is

^a Thus Melanchthon, *Erroremata Dialectica*, p. 109. "Cum querimus definitionem inspiciuntur tabulæ prædicamentorum. Unde discas an res, de qua dicturus es, sit substantia an accidens. Et si est accidens, in qua parte sit, in corpore an in anima, &c." And so Keckermann, *Syst. Log. Min.* lib. i. cap. 17. "In hunc enim usum istæ rerum tabulæ et delineationes præcipue illic adumbrantur, ut definitum quærat, simulque animo lustretur, quid ex parte superiori proxime definito adjaceat: id enim erit ejus Genus: e. g. cupio conficere definitionem Hominis: cogito ergo primum in quo prædicamento sit Homo, et deprehendo ex notis Substantiæ, esse in prædicamento Substantiæ: quocirca tabulam hujus prædicamenti perlustrans animo, deprehendo hominem proxime collocari sub animali: hinc concludo hoc esse proximum ejus genus. Sic in aliis proceditur definitis per singula prædicamenta."

analogous to that of drawing formal inferences, *virtually* contained in their premises, though not explicitly developed*. It is a process of self-examination, not dissimilar to the Platonic application of Dialectic, though widely differing as regards the objective truth of its results. For the Logical process furnishes only a subjective criterion; it enables us to represent more distinctly to the mind, the notions previously existing there in more or less confusion: its rules direct us to compare concepts one with another, and furnish some security for our own consistency in employing them; they do not enable us to ascertain their accordance with external objects, or to add the deficient parts, where they are inadequate representatives of the latter. The mind, like the sky, has its nebulae, which the telescope of Logic may resolve into their component stars. But here the parallel ceases. The Logical instrument discovers no luminary whose rays have not previously entered the eye; it tells us nothing of their relative distances, of the velocity with which their light travels; of any thing, in short, which did not form a confused portion of the sensuous representation†. This may seem but beggarly service to be performed by the Art of Arts and Science of Sciences. Inferior certainly it is to the gigantic purposes which more than one Logical Titan has essayed to accomplish with the same instrument. But let not its legitimate uses be condemned, because it has abated somewhat of the "vaulting ambition which o'erleaps itself." It furnishes the mould by which the ever-accumulating matter of consciousness is reduced to form and consistency: it were ungrateful to despise it, because it does not also dig the metal itself from the mine.

* Cf. Anal. Post. i. 24. 11.

† Cf. Kant, Logik, Einleitung. V.

NOTE D.

ON MATERIAL AND FORMAL CONSEQUENCE.

A MATERIAL CONSEQUENCE is defined by Aldrich to be one in which the conclusion follows from the premises solely by the force of the terms. This in fact means, from some understood Proposition or Propositions, connecting the terms, by the addition of which the mind is enabled to reduce the Consequence to logical form. This is easily seen, both in Aldrich's example, "Homo est animal, Ergo est vivens," and in the rather more complicated instance given by Sanderson, "Socrates est risibilis, ergo, Aliquis homo est rationalis." The latter, when the necessary conditions are supplied, is expanded into two syllogisms.

Omne risibile est rationale ;
Socrates est risibilis,
Ergo, Socrates est rationalis.
Socrates est homo,
Ergo, Aliquis homo est rationalis.

The failure therefore of a Material Consequence takes place when no such connection exists between the terms as will warrant us in supplying the premises required : i. e. when one or more of the premises so supplied would be *false*. But to determine this point is obviously beyond the province of the Logician. For this reason, Material Consequence is rightly excluded from Logic.

Moreover, even where true premises can be added, and the Consequence legitimately deduced, we cannot, except from knowledge of the matter, determine into what form the reasoning will naturally fall. In some cases, as in the example above quoted from Sanderson,

the proof may be given in Categorical Syllogisms. In others, it is far more naturally exhibited in the hypothetical form. The assumption of a hypothetical premise will always present the reasoning in a logically valid, though not always in the most natural, form; and it is frequently the only materially allowable assumption in cases where the given antecedent and consequent have both terms distinct. E. g. A is B, therefore C is D. We may supply, If A is B, C is D; but to determine the truth of the assumed proposition, whether it be hypothetical or categorical, does not fall within the province of the Logician.

Among these material, and therefore extra-logical, Consequences, are to be classed those which Reid adduces as cases for which Logic does not provide; e. g. "Alexander was the son of Philip," therefore "Philip was the father of Alexander;" "A is greater than B," therefore "B is less than A." In both these it is our material knowledge of the relations "father and son," "greater and less," that enables us to make the inference.

Another of Reid's examples is the following: "A is equal to B, and B is equal to C, therefore A is equal to C." This reasoning is elliptical, and therefore, *as it stands*, material; though owing to the suppressed premise being self-evident, its deficiency is apt to be overlooked. Stated in logical form, the syllogism runs thus:

Things that are equal to the same are equal to each other;
A and C are equal to the same,
Therefore A and C are equal to each other*.

Another example of the same kind is that sometimes called reasoning *a fortiori*. E. g. "A is greater than B,

* Hamilton on Reid, p. 702.

and B is greater than C, therefore *a fortiori* A is greater than C." The logical form is,

Whatever is greater than a greater than C is greater than C;

A is greater than a greater than C,

Therefore A is greater than C.

Or if it be required that the *a fortiori* nature of the reasoning appear in the conclusion, we must state the major, "Whatever is greater than a greater than C is greater than C by a greater difference."

Of the same kind is the reasoning "A is equal to B, therefore twice A is equal to twice B." The logical form is,

The doubles of equal things are equal;

Twice A and twice B are doubles of equal things,

Therefore they are equal.

The major premise might be stated more generally,
"Equimultiples of equal things are equal."

NOTE E.

IS THE SYLLOGISM A PETITIO PRINCIPII?

THE eagle of the Libyan fable was killed by an arrow feathered from his own wing. The armoury of the Logician has been fondly imagined to contain the fatal weapon of his own destruction. But the champion destined to wield it, if such there be, is somewhat tardy in his forthcoming. More than one Sir Kay has essayed the adventure of the sword; the Arthur destined to achieve it remains in all the mysterious dignity of a Coming Man. In other words, many writers have succeeded in shewing their own ignorance of the nature of the fallacy called *Petitio Principii*^a; they have not been equally successful in proving the invalidity of the Syllogistic process.

Let us first endeavour to ascertain what the *Petitio Principii* really is. The name is a blundering translation of the Aristotelian τὸ ἐν ἀρχῇ (or τὸ ἐξ ἀρχῆς) ἀντιόχαι: i. e. the assumption, not of the principle properly so called^b, but, in some form or other, of the *question originally* proposed for proof. And it is remarkable, that among the five modes of this fallacy enumerated by

^a Of the numerous absurdities gravely propounded by Logicians in relation to this fallacy, perhaps the happiest is the exquisite etymology of Du Marsais, *Logique*, p. 81. "Ce mot s'appelle *pétition de principe*, du mot, grec *πéτωμαι*, qui signifie *voler vers quelque chose*, et du mot latin *principium*, qui veut dire *commencement*; ainsi faire une *pétition de principe*, c'est recourir en d'autres termes à la même chose que ce qui a d'abord été mis en question."

^b "Without entering on the various meanings of the term Principle, which Aristotle defines, in general, *that from which any thing exists, is produced, or is known*, it is sufficient to say, that it is always used for that on which something else depends; and thus both for an original *law*, and for an original *element*." Sir W. Hamilton, *Reid's Works*, p. 761.

Aristotle, one is in form not distinguishable from the legitimate Syllogism*. Selecting this variety, as that by which most of all the objection is to be sustained, we will proceed to examine its peculiarities.

In the first place, it is manifestly necessary to a *Petitio Quæsitæ*^d, as the fallacy may more correctly be called, that there should be a question proposed for *proof*. And hence it was long ago acutely remarked by Petrus Hispanus, that such a fallacy cannot be committed in a Syllogism of *inference*°. If, that is, the truth of the premises is known beforehand, and the only question is, what may we infer *from them*? there is no necessity for *begging* or *assumption* of any kind. It is clear then, that not the Syllogism in general, but at most only one particular application of it, can beg the question.

But it may be answered, that the truth of such premises never can be ascertained, but by a previous induction embracing all particular cases, and that Syllogistic inference is therefore at least futile, since the conclusion drawn must be presumed to be already known. But this answer itself assumes what has never yet been satisfactorily proved, the dependence of all knowledge of Universals on Induction. If axiomatic principles can be acquired in any other way, one class of Syllogisms is at least exempt from the charge^f.

* Top. viii. 13. 2. Δεύτερον δὲ ὅταν κατὰ μέρος θεὸν ἀποδείξαι καθόλου τις αἰτήσῃ, ὅσον ἐπιχειρῶν ὅτι τῶν ἐναντίων μία ἐπιστήμη, ὅλος τῶν ἀντικειμένων ἀξιόσκει μίαν εἶναι.

^d Pacius in Anal. Prior. ii. 16.

* "Sciendum quod hæc fallacia non impedit syllogismum inferentem, sed probantem, et ita fallacia petitionis peccat contra syllogismum dialecticum in quantum dialecticus est." Summ. Log. Tract. vi.

^f Kant's criterion of necessity as the sure characteristic of a cognition *a priori*, has not yet been refuted by those who refer all principles to Induction.

And even in respect of principles allowed to be inductive, the actual previous assumption of every possible instance is not necessarily implied. And it is here that an able defender of the Syllogism, Mr. Mill, has taken a low and inadequate ground, a ground too, inconsistent with his own subsequent analysis of the process of Induction. His defence in fact amounts to an abandoning of all formal reasoning. All reasoning, he tells us, is really from particulars to particulars. But in that case, all inference must depend upon the matter, and cannot be reduced to any general type. If, for example, I conclude that the Duke of Wellington is mortal, solely from the premises, "John, Thomas, &c. are mortal, and the Duke of Wellington resembles these in certain other attributes;" I might, by an argument of precisely the same *form*, prove him to be a Frenchman, because he possesses the attributes of humanity in common with certain given individuals of that nation.

This portion of the question resolves itself into the following. What do we mean when we assert that all men are mortal? Is it merely a concise mode of stating that Socrates and Plato possess this attribute, in common with a number of other individuals, *quos nunc perscribere longum est*? If so, to argue, "Socrates is one of the individuals above mentioned, therefore he is mortal," is, if not a *begging* of the question, at least a needless repetition of a previous statement.

But, in fact, the Universal Proposition means no such thing. It means that, by virtue of a certain established law, certain attributes, or groups of attributes, are always so united, that in whatever individuals we find the one, we may look upon them as an infallible mark of the other. A conviction of this kind however, as it can never be gained by any mere observation of particulars,

so it need not presuppose a complete enumeration of them⁴.

"For, when one's proofs are aptly chosen,
Four are as valid as four dozen."

To determine under what conditions such a conviction can be obtained, is a question requiring an analysis of the whole process of Induction. Such an analysis, in many respects most ably performed⁵, will be found in the third book of Mr. Mill's *Logic*; but few I think can compare that part of the work with his earlier defence of the Syllogism, without admitting that the two presuppose different and inconsistent theories of the import of

⁴ "Hinc jam patet, inductionem per se nihil producere, ne certitudinem quidem moralem, sine adiumento propositionum nec ab inductione, nec ratione universali pendentium; nam si essent et adiumenta ab inductione, indigerent novis adiumentis nec haberetur certitudo moralis in infinitum. Sed certitudo perfecta ab inductione sperari plane non potest, adhibitis quibuscunque adiumentis, et propositionibus hanc: totum magis esse sua parte, sola inductione nunquam perfecte scimus. Mor enim prodibit, qui negabit ab peculiarem quandam rationem in aliis nonnullis tentatis veram esse." Leibnitz, de Stylo Nicolii.

Mr. Mill's *principles* to Induction are certain canons stating the principles of the Method of Agreement, of Difference, &c. which, together with the whole law of universal causation, he makes dependent upon a weaker evidence than philosophical induction: *the inductive per enumerativum simpliciter*. At the same time he avows his protest against "admitting, as evidence of the truth of a fact in external nature, any necessity which the human mind may be conceived to be under of believing it." His words, strictly taken, would on his own showing destroy the evidence of our senses; for, according to the theory of perception adopted by himself and his favourite authority, Brown, sensations can only be regarded as states of mind, and the only reason we have for referring our internal consciousness to an external cause is, that by the constitution of our minds we are necessitated to do so. The admonition of Hume is not quite obsolete even amid the lights of modern philosophy. "The main principles of Reason are in themselves apparent. For to make nothing evident of itself to man's understanding were to take away all possibility of knowing any thing. And herein that of Theophrastus is true, 'They that seek a reason of all things do utterly overthrow Reason.'" Eccl. Pol. l. 9. 3.

⁵ His theory of Causation must however be excepted.

Universal Propositions. It will be sufficient, however, for my present purpose to observe that, unless the establishment of an Universal Proposition requires an explicit and conscious examination of every existing and also of every possible particular instance, no charge of *Petitio Principii*, or even of vain repetition, can be maintained against the Syllogism. Those who maintain the antecedent, abandon themselves to an absolute scepticism¹; and against such, no defence of any source of human knowledge can or need be attempted.

With regard to the syllogism of *proof*, we may examine the question a little more closely. The *Petitio Principii* is a *material*, not a *formal* fallacy, and consists in assuming, in demonstration, a non-axiomatic principle as axiomatic, or in dialectic disputation, a non-probable principle as probable². It does not affect the form of the reasoning; but depends on the selection of premises, when the syllogism is employed for the particular purpose of *proof*, demonstrative or dialectic. Those are guilty of it who do not adopt such premises as the laws of the two processes require; in the one case, propositions axiomatic or deducible from axioms; in the other, probable statements, sanctioned by the general opinion of mankind or the authority of eminent persons.

In reading Aristotle's account of this fallacy, it is evident that the whole point of the matter lies in the word *αἰτεῖσθαι*, or *λαμβάνειν*; and that the question to be asked is, not whether the premises virtually contain the con-

¹ Sed ea ratione prorsus evertuntur scientiæ, et Sceptici vicere. Nam nunquam constitui possunt ea ratione propositiones perfecte universales; quia inductione nunquam certus es, omnia individua a te tentata esse; sed semper intra hanc propositionem subsistes, omnia illa, quæ expertus sum, sunt talia; quum vera non possit esse ulla ratio universalis, semper manebit possibile, innumera, quæ tu non sis expertus, esse diversa." Leibnitz, de Stylo Nizolii.

² See Anal. Pr. ii. 16. Top. viii. 13.

clusion¹, but whether such premises can properly be said to be *begged*, or *assumed*². It is clear then that *Petitio Principii* is not the fault with which the Syllogism is chargeable, unless it can be shewn that every statement of an Universal Proposition must be, in this sense of the term, *begging* or *assuming*. If there are any cases in which the assertion of such propositions depends on a warranted conviction, not on a gratuitous assumption, from whatever source that conviction may arise, such cases must be exempt from the charge of *Petitio Principii*.

And if there be any such cases, the opponents of the Syllogism have themselves unwittingly stumbled upon a fallacy cognate to that with which they taunt its

¹ One class of reasonings are perhaps fairly chargeable with the fallacy. I allude to what are commonly called the *proper syllogisms* of the Ramists, which have two Singular Premises. In the first figure, it is evident that the conclusion is not one out of many inferences contained in the major premise, but the very same proposition stated in different language. The third figure is open to the same objection, but it may be allowed as an *ἐκθεσις* or expository instance—a process not reckoned by Aristotle as syllogistic. Proper syllogisms in the second figure are valid, and frequently serviceable; but when reduced to the first, (which Aristotle regards as a necessary test of validity,) the negative premise must be converted from singular to universal.

Nevertheless, as the *Petitio Principii* is a material, not a logical, fallacy, this does not furnish grounds for objecting to the convenient arrangement by which singular propositions are considered as in syllogism equivalent to universals. They may be regarded, in common with other cases of the same fallacy, as reasonings valid in form, but unsound from material circumstances.

The Proper Syllogisms, however, though a post-Aristotelian innovation, did not originate with Ramus. Aquinas expressly denies that both premises in a syllogism may be singular, and admits the *ἐκθεσις* as a non-syllogistic process, being an appeal to the senses, not to the reason. See Opusc. xlvii. init. Occam, on the other hand, virtually surrenders the whole principle, when he allows that the major premise in the first figure may be singular. Logic, p. iii. cap. 8.

² That axiomatic principles are not of this character, may be seen from Anal. Post. i. 10. 6. Οὐκ ἔστι δ' ἐκθέσις οὐδ' ἀπρημα, δ' ἀνάγκη εἶναι δι' αὐτὸ καὶ δοκεῖν ἀνάγκη.

defenders. For the *Petitio Principii* being in that case a particular misapplication of the syllogistic method, and postulating the latter as a condition of its practicability, they have inverted the relation of prior and posterior, and assumed *Petitio Principii* to be necessary to the existence of Syllogism.

But if, on the other hand, there are no such cases, and the Syllogism is in consequence henceforth to be banished from Philosophy, what do we gain in exchange? We reduce the Laws of Thought from necessary to contingent. We degrade certainty into probability, and can claim for that only a subjective validity. But until this latter hypothesis is proved, the Syllogism, whatever may be its errors or deficiencies, cannot be comprehended under any one of the fallacies *admitted to be such by the Logician*. And this is sufficient as a defence of his own consistency. His method may be an incorrect analysis of the laws of the reasoning process; it may be that there are no such laws at all. But of either of these positions the *onus probandi* lies with the assailants, not with the defenders of the Syllogism^a. It is quite enough for the Logician, if he exhibit all that is generally considered valid reasoning in a syllogistic form. If any maintain that a simpler or better type is attainable, he waits with patience till they produce it. If all reasoning is fallacious, he may be contented to behold his theories fall in the general overthrow of all human knowledge. But, pending the decision of this question, he may leave

^a To the charge of *Petitio Principii* which Campbell makes against the Syllogism, Archbishop Whately replies, that it *lies against all arguments whatever*; the Syllogism not being a distinct kind of argument, but any argument whatever, stated regularly and at full length. And this reply is substantially valid, even if we reject the Archbishop's mode of exhibiting Induction as a Syllogism in Barbara. For the objection of Campbell, if valid at all, lies against all formal reasoning; and logical Induction, in its true analysis, is equally formal with the Syllogism.

his adversaries their choice of one or the other horn of a dilemma. If there are universal principles of truth not entirely dependent on sensation, the existence of such principles will warrant syllogistic inference. If there are not, whatever be the value of our individual sensations, all inference from them, by induction, example, analogy, or any method whatever, is, in respect of objective certainty, worthless.

NOTE F.

ON THE ENTHYMEME.

THE Enthymeme is defined by Aristotle, συλλογισμὸς [ἀτελής] ἐξ εἰκότων ἢ σημείων. The word ἀτελής is now universally admitted to be spurious; and that upon abundantly sufficient evidence, both external and internal*. Externally, it is not countenanced by the best MSS. Internally, it is inconsistent with the ordinary language of Aristotle; with whom the *imperfect syllogism* signifies, not a Syllogism with one portion suppressed, but a Syllogism in the second or third figure, which is not immediately evident by the *dictum de omni et nullo*. The word is an interpolation, and a clumsy one, designed to accommodate Aristotle's definition to subsequent views of the nature of the Enthymeme, and made by a scribe not particularly well versed in Aristotelian phraseology.

The εἰκὸς and σημείον themselves are Propositions^b; the former stating a *general probability*, the latter a *fact*, which is known to be an indication, more or less certain, of the truth of some further statement, whether of a single fact or of a general belief. The former is a proposition nearly, though not quite, *universal*; as, "Most men who

* For a full account of the evidence on this point, see Pacius on Anal. Pr. ii. 27. 3. and Sir W. Hamilton, in Ed. Rev. No. 115. p. 222.

^b As is stated, An. Pr. ii. 27. 1. and Rhet. i. 3. 7. In a looser sense, however, the terms εἰκὸς, σημείον, τεκμήριον, are often used for the Enthymemes drawn from each. The εἰκὸς is clearly regarded by Aristotle as a *general proposition*, employed as a premise. In the Rhetoric, i. 2. 15. he describes it as having the same relation to its conclusion as an universal to a particular. In another sense, any proposition may be called probable, which can as a *conclusion* be supported upon (morally) reasonable grounds; in which sense Anaximenes, or whoever was the Author of the *Rhetorica ad Alexandrum*, defines the εἰκὸς. (ch. 8. 4.)

envy hate:" the latter is a *singular* Proposition, which however is not regarded as a sign, except relatively to some other Proposition, which it is supposed may be inferred from it. The *εἰς*, when employed in an Enthymeme, will form the *major premise* of a Syllogism such as the following :

Most men who envy hate,
This man envies,
Therefore, This man (probably) hates.

The reasoning is logically faulty; for, the major premise not being absolutely universal, the middle term is not distributed.

The *σημεῖον* will form one premise of a syllogism which may be in any of the three figures, as in the following examples :

Fig. 1.	Fig. 2.
All ambitious men are liberal;	All pregnant woman are pale,
Pittacus is ambitious (Σ),	This woman is pale (Σ),
Therefore, Pittacus is liberal.	Therefore, She is pregnant.

Fig. 3.
Pittacus is good (Σ)^c,
Pittacus is wise,
Therefore, All wise men are good.

^c In the first and second figures, the *σημεῖον* is clearly the *minor* premise; this alone being singular. In the third, as far as quantity is concerned, we may choose between both premises. It seems more natural however to prefer the major; because, in assigning a reason for our belief in a given proposition, we should naturally state a premise having either the same *predicate* or the same *subject*; not one in which the predicate of the premise is the *subject* of the conclusion. For example; Why do you believe Pittacus to be liberal? Because he is ambitious. Why do you believe wise men to be good? Because Pittacus is good. This is far more natural than to answer, "Because Pittacus is wise." The same consideration will furnish the data for interpreting an obscure passage in Anal. Pr. ii. 26. 5. which however it would exceed my present limits to attempt. The reader will find it rightly explained in a note to St. Hilaire's Translation, vol. ii. p. 341. with the exception that the syllogism may be more clearly stated in Cesare than in Camestres.

The Syllogism in the first figure is alone logically valid. In the second, there is an undistributed middle term: in the third, an illicit process of the minor.

The *σημείον* is defined by Aristotle, *πρότασις ἀποδεικτική ἀναγκαία ἢ ἐνδοξος*; in which the words *necessary* and *probable* do not relate to the modal character of the Proposition in itself, but to the nature of its connexion with the Conclusion which it is adduced to prove; i. e. to its *logical* validity when the other premise is added^d; *without which addition, expressed or understood, there is no Enthymeme at all*^e.

But it may be thought that the above examples do not furnish a sufficient criterion for distinguishing between the two kinds of Enthymeme. If both premises *must be* mentally, and *may be* orally, supplied, before there is any Enthymeme at all, how are we to determine whether any given specimen is an instance of reasoning from a sign, or from a likelihood? Why, for example, in the

^d Rhet. i. 2. 17. Ἀναγκαῖα μὲν οὖν λόγῳ ἐξ ὧν γίνεται συλλογισμός. Cf. Anal. Pr. i. 1. 6. Συλλογισμός δὲ ἐστὶ λόγος ἐν ᾧ τεθέντων τινῶν ἑτερόν τι τῶν κειμένων ἐξ ἀνάγκης συμβαίνει. Here *sylogism* is used in its strictest sense. From another passage in the Rhetoric (i. 2. 14.) it has sometimes been imagined that all *σημεῖα* are necessary, at least as *propositions*; and the *σημείον* has even been defined, "a proposition in necessary matter;" as if "necessary matter" were the proper province of Rhetoric. The interpretation however is too inconsistent with Aristotle's subsequent language to be tenable. The words in question, if properly belonging to this place, (the resemblance to Rhet. i. 2. 8. is suspicious,) must be so interpreted as to identify the necessary propositions with one class only of *σημεῖα*, the *τεκμήρια*. The reference to the Analytics I conceive to allude, not to the account of modal conclusions deduced from modal premises, but to the *necessary conclusiveness* of premises logically connected, as opposed to the more or less *probable conclusiveness* of illogical combinations. As a special reference, supply Anal. Pr. i. 27. 12.

^e Anal. Pr. ii. 27. 4. Ἐάν μὲν οὖν ἡ μία λεχθῇ πρότασις, σημείον γίνεται μόνον, ἐάν δὲ καὶ ἡ ἑτέρα προσληφθῇ, συλλογισμός. The context shews that he is speaking of Syllogism only in the looser sense in which all Enthymemes are included.

instance given above, may we not call the fact that "this man envies," a *sign* that he hates, as well as the general statement a likelihood? Does not the whole distinction depend on the question, which is the *stated*, which the *suppressed*, premise?

To this it may be replied, that Aristotle distinguishes the *εἰκὸς* and *σημεῖον* merely as propositions, and no where says that they may not be combined in the same syllogism. In the instance given, it *so happens* that the minor premise is a singular proposition, and may fairly be considered a *sign* of the conclusion. But we might obviously employ a minor premise of another kind, such as, "All malignant men are envious;" in which case there is, properly speaking, no *sign* employed in the reasoning. But this does not affect the distinction between the two *Propositions*. A likelihood is such, *per se*,—a proposition stating a general truth, which we are at liberty to apply or not to particular cases. A sign is a sign of something else,—a single fact stated as a proof of something further; which proof may, according to material circumstances, be logically or only *morally* conclusive.

Another question sometimes raised is, "If the Enthymeme has both premises supplied, how is it to be distinguished from the Dialectic Syllogism?" To which it may be answered, that, taking the word Syllogism in its strictest sense, as a reasoning logically correct, the same argument may in different points of view be considered either as a Syllogism or an Enthymeme. This is, of course, only the case with the *τεκμήριον*; the other specimens of the Enthymeme being logically invalid. The argumentation *ἐκ τεκμήριου* is in this sense both an Enthymeme and a Syllogism;—an Enthymeme on material grounds, inasmuch as its premise is a *sign* of its conclusion;—a Syllogism on formal grounds, inasmuch as it complies with the conditions of logical

reasoning. It is a Dialectic Syllogism, if employed for the purpose of dialectic disputation; and, as it usually relates to those subjects to which dialectic disputation is practically applied¹, it may in general be regarded as, potentially at least, dialectic².

In fact, it is not as an Enthymeme, but as a *Rhetorical Syllogism*, that a given specimen of reasoning is distinguished from the Dialectical. The object of the two arts is distinct. That of Dialectic is to convince the Intellect; that of Rhetoric, to persuade the Will. The same instrument may be employed by both, and it is merely the purpose for which it is employed that constitutes the distinction between them³. Whether the same means are always available for both purposes; whether the same informality of reasoning is allowed in Dialectic as in Rhetoric, must depend on the conditions by which the disputants in the former choose to bind themselves. The Rhetorician has to influence an audience: if he can effect this, he will not always be scrupulous about

¹ This, however, is by no means necessary. Matters not usually discussed either by the Dialectician or Orator may equally be proved by means of *τεκμήρια*. For example; the falling of the thermometer to 32° is a *sign* of freezing; the obscuration of the moon in eclipse is a *sign* that the earth's shadow is interposed between it and the sun. Such subjects are not *practically* dialectical, at least in Aristotle's view of the art. As far as the mere interrogatory form is concerned, it may be, and was by different Philosophers, applied to all varieties of matter.

² This proceeds on the supposition that the Dialectician is bound to logical accuracy in his reasonings; a restriction which Aristotle at least would regard as salutary. See Anal. Post. i. 6. 10. We need not however suppose that all disputants actually conformed to it.

³ Cf. Crakanthorpe, *Logic*, lib. v. cap. 1. "Utrique Disciplinæ hoc commune est, quod doceat probabiliter arguere: finem vero diversum uterque sibi proponit. Quoniam ergo eadem omnino formâ probabiliter arguendi uterque utitur, nos hic quod utrisque commune est tractabimus, unicuique liberum relinquentes, an Dialecticus esse velit, et uti hac formâ probabiliter arguendi *ad verum inveniendum*; an Rhetor, et uti eadem formâ probabiliter arguendi *ad suadendum aut dissuadendum*."

the logical accuracy of his reasoning. In Dialectic, two champions are opposed to each other: they may, before engaging, dictate the conditions of the combat.

As regards the account of the Enthymeme in the Prior Analytics, I am not aware that any further explanation is neededⁱ. But in the corresponding chapters of the Rhetoric one or two difficulties remain, an elucidation of which, though not strictly within my present province, may perhaps be serviceable to the readers of the latter Treatise.

In Rhet. i. 2, 18. we are told, that when the Enthymeme is in the third figure, the *σημείον* is to its conclusion as a particular to an universal. In the second figure, on the other hand, as an universal to a particular. The relation in the first figure is not mentioned, but the context seems rather to connect it with the former than with the latter.

This passage may be interpreted in two ways. Either we may compare the conclusion of the Enthymeme with the *σημείον* itself, or with the major premise of that Syllogism whose minor is the *σημείον*. In the former interpretation the word *σημείον* is used properly for the *proposition*; in the latter widely, for the reasoning of which such proposition forms a portion.

If the first interpretation be adopted, (which seems preferable,) we must compare the two propositions relatively to that term in which they are unlike; i. e. if they have the same subject, we must compare their

ⁱ Except perhaps that Aristotle, in Anal. Pr. ii. 27., admits a *σημείον* in the second figure, which in the former chapter he condemned. The condemnation seems to be made on logical grounds. The *logical* value of two affirmative premises in the second figure is absolute zero; whereas the *σημείον* in the third figure, though faulty as employed to prove an universal conclusion, is valid for particulars. For rhetorical purposes, however, the second figure is also admissible; an accumulation of Enthymemes, all *logically* worthless, may amount to a *moral* certainty.

predicates; if they have the same predicate, we must compare their subjects.

According to this method, it will be seen, that in the first figure, the predicate of the sign is to that of its conclusion as part to whole, or as species to genus. Hence its logical validity: whatever subject is included under a species is necessarily included under its genus. But in the second figure the relation is that of whole to part, or of genus to species; and this is illogical, the whole genus not being included under one of its species.

But if we adopt the second interpretation, and compare the major premise with the conclusion, we shall be compelled in the first figure to compare together the two *subjects*, since both propositions have the same predicate. In this case the relation will be inverted; the premise being to the conclusion as an universal rule to a single instance. In the second figure, we are at liberty to compare either the quantity of the two propositions as determined by their subjects, or the extent of their respective predicates. In either case, however, the result is the same; the relation remaining that of universal to particular.

The Enthymeme in the third figure presents no difficulty. Whichever interpretation be adopted, the same Proposition, "Pittacus is good," is compared with the conclusion, "All wise men are good." In both cases, the comparison lies between the two subjects, and the relation is that of particular to universal.

But perhaps the most difficult passage in this portion of the Rhetoric is that in which Aristotle describes an important, and previously, as he tells us, unnoticed distinction between various classes of Enthymemes. Some of these, he says, belong to Rhetoric, some to other arts and faculties. The same may be said of the connexion of the Syllogism with Dialectic. Dialectical

or Rhetorical reasonings are founded on *τόποι*; the others on the peculiar principles of that Science or Art to which they belong¹.

This passage is generally found puzzling to a beginner on two accounts. Firstly, he is apt to fancy Dialectic synonymous with Logic, and to confound it with the formal Science of that name; an error which the Commentary most likely to fall in his way is not unlikely to confirm. Secondly, having previously seen the Enthymeme defined as the Rhetorical Syllogism; there seems some inconsistency in the subsequent observation, that some Enthymemes are Rhetorical, others not so.

In explanation it may be observed. Firstly, that Dialectic and Rhetoric are not formal Sciences, but material Arts. Their Logic is not a *Logica docens*, treating of the general form of Reasoning, but a *Logica utens*, treating of Reasoning as applied to a particular matter. That matter is furnished by the *τόποι*. Rhetoric and Dialectic do not merely lay down the form in which their reasonings ought to proceed, but likewise provide certain general principles of probability, from which the matter of their major premises is to be drawn. These *τόποι* or common-places hold the same position in the Dialectic Syllogism, as the most universal kind of axioms in the Demonstrative. They are not gained by exclusive observation of any one particular class of objects belonging to this or that art or faculty, but are indifferently applicable to all. Such is the example quoted by Aristotle as *ὁ τοῦ μᾶλλον καὶ ἧττον τόπος*. Of this in the Topics he gives four cases, of which the following may be taken as a specimen. "If the more likely assertion on any subject be untrue, the less likely is probably untrue likewise." A general maxim of this

¹ Rhet. i. 2. 20, 21.

kind is obviously available *περὶ δικαίων καὶ φυσικῶν καὶ περὶ πολιτικῶν, καὶ περὶ πολλῶν διαφερόντων εἶδει.*

Secondly, it may be observed that the Enthymeme is not necessarily confined to the Rhetorical kind of matter. A syllogism from likelihoods or signs, whatever be the object, is an Enthymeme. In like manner, any syllogism in probable matter may become an instrument of Dialectic reasoning; whether it be based on the general probabilities which Dialectic materially furnishes, or on more limited assumptions drawn from special observations. The Physician, for example, within the field of his own experience, may know that in nine cases out of ten where a patient exhibits certain symptoms, the disease terminates fatally. The student of history may learn that in the majority of cases revolution leads to anarchy, and anarchy is suppressed by despotism. Either of these may become the basis of a reasoning process in probable matter, but the Syllogism or Enthymeme is not, properly speaking, Dialectical or Rhetorical, but Medical or Political. And although there is nothing in the Dialectical or Rhetorical Method that prevents its being applied to these or any other special subjects, yet in proportion as any one so applies it, Aristotle regards him as departing from the legitimate *matter* of Dialectic or Rhetoric, and adopting that of some definite Art or Science¹. For the same reason, when he speaks of the special application of Rhetoric to Political deliberation, he warns us that its object matter must not be considered as that of Rhetoric *per se*, but as primarily and properly belonging to Politics, secondarily only to Rhetoric in one of its practical applications².

¹ Rhet. i. 2. 21. Ταῦτα δέ, ὅσῳ τις ἂν βέλτιον ἐκλέγῃται τὰς προτάσεις, λήσῃ ποιήσας ἄλλην ἐπιστήμην τῆς διαλεκτικῆς καὶ ρητορικῆς· ἂν γὰρ ἐντόχῃ ἀρχαῖς, οὐκέτι διαλεκτικὴ οὐδὲ ρητορικὴ ἀλλ' ἐκείνη ἔσται ἣς ἔχει τὰς ἀρχάς.

² Rhet. i. 4. 4, 5.

A few words in conclusion on the origin of the name Enthymeme. That its etymology is to be found in *ἐν* and *θυμός*, is undeniable; but only in the same degree as is also true of *ἐνθυμῆσθαι*, *ἐνθύμιος*, and other cognate terms. But that it has no special reference to a premise *in the mind*, is evident; firstly, because *θυμός* in the Aristotelian phraseology is not "the mind," and has nothing to do with the expression or suppression of premises; secondly, because the word *ἐνθύμημα* occurs in writers earlier than Aristotle, and before it could have assumed its technical meaning. To ascertain the true derivation, however, is not so easy as to refute a palpably absurd one. If, however, we were compelled to make a suggestion, the following, though not confidently put forward, has at least the merit of not being positively ridiculous. According to the analogy of words of the same termination, such as *φιλοσόφημα*, *ἐπιχειρήμα*, *σβόρισμα*, &c. *ἐνθύμημα* will properly signify the result of an act of reflection^a. Hence it is used by Sophocles for a *thought suggested* by a person or thing^b, and by Xenophon^c for a *plan designed*, opposed to *ἔργον*, the execution. The term is thus naturally enough applicable to the *suggestions* or *persuasive arguments* of Rhetoric, as distinguished from the *demonstrations* of Science.

^a Cf. Melanchthon, *Erotem. Dial.* p. 187. Enthymema significat cogitationem seu quiddam cogitatum, ut nos dicimus, *Ein Bedenken*.

^b *Æd. Col.* 292, 1109.

^c *Anab.* iii. 5. 12.

NOTE G.

ON INDUCTION.

INDUCTION, as far as it is a Logical process at all, is equally formal with Syllogism; though proceeding in the inverse order; viz. from the aggregate of individuals to the universal whole constituted by them; instead of from the whole to the several individuals contained under it. It is defined by Aristotle, "proving the major term of the middle by means of the minor^a;" in which definition, the expressions *major*, *middle*, and *minor*, are used relatively to their *extension*, to designate respectively the attribute proved, the constituted species of which it is proved, and the aggregate of individuals by which the species is constituted. The form in which the Inductive Reasoning^b naturally appears, exhibits an apparent, though not a real, resemblance to the *third* figure of Syllogism. Thus:

X, Y, Z, (minor,) are B (major);
 X, Y, Z, are all A (middle); therefore,
 All A is B.

The resemblance to the third figure is apparent only; the true distinctions being, 1. That in the minor premise of the Induction, the copula does not represent the subject as *contained under*, but as *constituting*, the predicate. 2. That in consequence of this distinction,

^a Τὸ διὰ τοῦ ἑτέρου θάτερον ἄκρον τῆ μέσφ συλλογίσασθαι. Anal. Pr. ii. 23. 2.

^b In a loose sense, Aristotle calls it *ὁ ἐξ ἐπαγωγῆς συλλογισμός*, where the word does not denote the syllogism proper, or reasoning from the universal whole to the contained parts, but is extended to formal reasoning in general. In like manner, in Rhet. ii. 25. 8. he speaks of the Enthymeme as including Example.

an universal conclusion is logically drawn in this form, which is not valid in the third figure of Syllogism.

We see then, that in the Inductive process the Copula is ambiguous, expressing in the major premise and in the conclusion, the relation of a contained part to a containing whole; in the minor premise, that of constituting parts to a constituted whole. This ambiguity has been remarked as a deficiency in technical language^c; but there is no term sufficiently naturalized in Logic to serve as a substitute to express the latter relation.

On Induction, as exhibited above, it may be remarked,

I. That the distinction between a perfect and an imperfect Induction is extralogical. Logic recognises no inference that is not necessitated by the Laws of Thought: and therefore it must be presumed that the Induction is *perfect*, i. e. that the Individuals mentioned are in reality the whole constituents of the species, before the Inductive Inference can come in any way within the province of the Logician. To inquire what is the warrant for this presumption; to ask what amount of observation will warrant us in assuming X, Y, and Z, to be *all* the members of the class A; is like asking in syllogistic reasoning, how do we know that the premises are true? undoubtedly a most important question, but not to be answered by Logic. So also any compromise with material probability, any statement of the individuals as *samples* or *adequate representatives* of their class^d, is a surrender of the essential principle of Logical Reasoning: the parts *are* absolutely the whole; or the inference is, logically speaking, worthless.

It is manifest, however, that the Induction may be easily stated in such a form, as to transfer the material

^c Edinburgh Review, No. 115. p. 229. From this admirable Article the greater part of the materials for the present note have been derived.

^d Whately's Logic, p. 260. (Sixth Edition.)

difficulty from the minor premise to the major; in which case the question may be satisfactorily answered by that Art or Science to which the Proposition materially belongs. Thus the example given by Aldrich might be stated as follows:

The magnets which I have observed, and also those which I have not observed, attract iron ;
 The magnets which I have observed, and those which I have not observed, are all magnets ;
 Therefore, All magnets attract iron.

In this mode of stating, the minor premise is undeniably true. The doubtful part of the major, relating to the properties of unobserved objects, must be determined by the analogies of the Science to which the objects belong, and by the *material* inquiry, what kind of samples or specimens will warrant our asserting of others what we have observed in them.

II. It is precisely in the mode of answering this material inquiry, that the whole difference lies between the ancient *Inductio per enumerationem simplicem*, and that Interpretation of Nature insisted upon by Bacon. The disciple of the former method, when asked, How do you know that other specimens of your class possess the same property as these? will reply, Because I have never seen one which does not possess it. The Baconian, on the other hand, will answer, Because I have selected such instances as give evidence of an universal law. I have examined those specimens of the class which have nothing in common, except the possession of the property in question: I have compared them with objects not possessing it, and I find its absence always accompanied by that of one of the essential attributes of this class*.

* Bacon, Nov. Org. lib. ii. Aph. x sqq. xxii sqq.

A recent writer has exhibited the Inductive Method of Socrates as a specimen of that *Inductio per enumerationem simplicem* which the Baconian philosophy has superseded¹. But it has been before observed that the Socratic reasoning is not properly *Induction*, but *Example*. It is inconclusive, not because it is an Induction by Simple Enumeration, but because it is no Induction at all. The Simple Enumeration, if complete, will form the basis of what, logically speaking, is a valid Induction; and it is precisely because the Socratic Method does not pretend to completeness, that Logic does not recognise the inference. It is true that in Simple Enumeration this completeness is often difficult, sometimes impossible to attain. And it is the additional security on this point that constitutes the chief merit of the Baconian process. But this is a *material*, not a *logical*, merit. It affects our *ground of confidence* in the truth of certain propositions, not the *nature of the inference* from those propositions assumed to be true. Neither in Induction nor in Syllogism does the Organon of Bacon supersede that of Aristotle. "Each," as Sir W. Hamilton observes, "proposes a different end; both, in different ways, are useful²." The ancient Philosopher considers "the laws under which *the subject* thinks;" the modern, "those under which *the object* is to be known." The Induction of Bacon, as furnishing more accurate rules for physical investigation, may supersede the Induction of Socrates; for the latter owes its validity solely to the *matter*. It cannot affect the Induction of Aristotle, of which the validity depends solely on the *form*.

The perversions of the Aristotelian Induction by Aldrich and Archbishop Whately have already been noticed. On this point it will be sufficient to observe, that any attempt

¹ Lewes, Biographical History of Philosophy, vol. i. p. 215.

² Reid's Works, p. 712.

to reduce Induction to Syllogism, in the strict sense of the term, must commence by inverting the whole operation; stating as a preliminary assumption that which is really the conclusion of the Inductive process. It moreover leaves us no alternative between converting mere empirical judgments into self-evident axioms, or destroying the whole foundation of reasoning, by commencing with a Syllogism whose premises themselves must be proved by another Syllogism, and so on *ad infinitum*.

The Aristotelian Induction proper has been described as an *analytical*, its counterpart, Syllogism, as a *synthetical* process; and the two have respectively been identified with the λόγοι ἐπὶ τὰς ἀρχὰς and ἀπὸ τῶν ἀρχῶν of Aristotle^b. And this is in one sense correct, though, according to a various notion of whole and part, the terms Analysis and Synthesis have perpetually been interchanged with each other. According as we look to the *comprehension*, or to the *extension* of the notions, we may regard the Genus as a part of the Species, or the Species as a part of the Genus. Hence the notions of Synthesis and Analysis, of the composition of parts into a whole, and the resolution of a whole into parts, will, as we adopt the one or the other point of view, be inverted. We have previously spoken of Induction as an inference from the constituting parts to the constituted whole. In this respect it is *synthetical*, the parts and whole being viewed in their *logical* or *extensional* relation. In the same point of view, the Platonic method of division is sometimes called analytical^c. On the other hand, in the ordinary modern use of the terms, Induction is analytical, adopting the *metaphysical* relation of part and whole as simpler or more complex notions.

^b See Michelet in Eth. Nic. p. 25.

^c Diog. Laert. iii. 24. Van Heusde, *Initia*, p. 261.

In this point of view, Division and Definition are respectively the Synthesis and Analysis of notions *as expressed in simple terms*. In the former, we combine Genus and Differentia into Species; in the latter, we resolve Species into Genus and Differentia. A similar relation exists between the processes of uniting Accidents to a Species, in distinguishing its several individuals, and abstracting the Specific notion from the Accidents, in the formation of Universals. Syllogism and Induction in like manner are respectively the Synthesis and Analysis of the same notions *when forming the subjects of a judgment*. For on examination of the first figure, which is the natural form of Syllogism, it will be seen, that it proceeds, by *division* of the middle term, to predicate of the several Species what was previously predicated of the Genus. Induction, on the other hand, in its natural form, proceeds by a process of *abstraction*, from the individuals constituting a Species to their common Species so constituted.

As regards the etymology of the name; both the Greek *ἐπαγωγή*, and its Latin equivalent *Inductio*, seem to have been originally applied with reference to the Socratic *accumulation* of instances to serve as an antecedent for establishing the required conclusion. The Platonic use of *ἐπάγειν* will support this view^k. Such is also clearly the interpretation of Cicero. "Hoc in genere præcipiendum nobis videtur, primum, ut illud quod *inducemus* per similitudinem, ejusmodi sit, ut sit necesse concedi; nam ex quo postulabimus nobis illud quod dubium sit concedi, dubium esse idipsum non oportebit. Deinde illud ejus confirmandi causa fiet *Inductio*, viden-

^k Cratyl. p. 420. d. Ταῦτα ἤδη μοι δοκεῖς, ὁ Σόκρατες, πικρότερον ἐπάγειν. Where Heindorf renders, "Confertius quam priora afferre, ita ut alterum alteri addas, in singulis nihil immorans." The substantive *ἐπαγωγή* has a very different sense in Plato; e. g. Leg. xi. 933. d. Cf. Ruhnken, *Timæus*.

dum est ut simile iis rebus sit, quas res, quasi non dubias, ante *induxerimus*¹." Quintilian, however, applies the term rather to the *bringing in*, as an inference, of the question to be proved. "Nam illa, qua plurimum Socrates est usus, hanc habuit viam; cum plura interrogasset, quæ fateri adversario necesse esset, novissime id, de quo quærebatur, *inferebat*, cui simile concessisset; id est inductio²." Another meaning of the Greek *ἐνάγυν* and *ἐναγωγός*, as well as of the Latin *inducere* and *inductio*, might seem to point rather to the persuading and influencing the mind of the hearer³. But the first derivation is preferable. The question, however, as far as Aristotle is concerned, is not of any great consequence. For, as that Philosopher did not invent the name, but only modified the usage of a term current among his predecessors, the etymology will be of little service towards illustrating the notion which he attached to it.

¹ *De Inventione*, i. 32.

² *Inst. Orat.* v. 11.

³ Rod. Agric. *de Inv. Dial.* ii. 18. Melanchth. *Erot. Dial.* p. 188. Burgerdsd. *Inst. Log.* ii. 11.

NOTE H.

ON EXAMPLE AND ANALOGY.

EXAMPLE is defined by Aristotle, "proving the major term of the middle by a term resembling the minor^a." This definition is obscure, from being worded so as to contrast with his definition of Induction, in which the major term is proved of the middle by the minor. It does not apply to the singular conclusion ultimately established, but to the universal proposition which forms the conclusion of the inductive portion of the Example. Thus, if we expand Aristotle's instance into its complete form, composed of an imperfect induction and a syllogism, it will run thus:

The war of the Thebans and Phocians (D) was an evil (A),

The war of the Thebans and Phocians was a war between neighbours (B),

∴ All wars between neighbours are evil.

A war between the Athenians and Thebans (C) is a war between neighbours,

∴ It is an evil.

In this reasoning there are four terms, A the major, B the middle, C the minor, D the *ὁμοῖον*. The definition applies to the third proposition, in which A is proved of B by means of D. If the final conclusion were taken into account, the Example might be more correctly defined as a reasoning in which the major term is proved of the minor by means of a middle, of which middle the major has been proved by a term resembling the minor.

^a Παράδειγμα δ' ἐστὶν ὅταν τῷ μέσῳ τὸ ἀκρον ὑπάρχον δειχθῇ διὰ τοῦ ὁμοίου τῷ τριτίῳ. Anal. Pr. ii. 24. 1.

Example differs from Induction in two principal points. 1. Induction enumerates all the individuals in the minor term, so as to constitute the middle; Example selects single instances. 2. Induction stops at the universal conclusion; Example proceeds to infer syllogistically a conclusion concerning another individual^b.

The Example, as thus exhibited, has no *logical* value. We are not warranted in assuming, as a necessary law of thought, that two things which resemble each other in *any one given quality* must likewise resemble each other in *any other*^c. The reasoning may have more or less *material* weight, according to the character of the particular qualities compared and to what we may empirically know of their connection with each other. It thus comes under the kind of evidence mentioned by Bishop Butler^d as *probable*; which admits of degrees, and of all variety of them, from the highest moral certainty, to the very lowest presumption. But degrees of evidence are inadmissible in Pure Logic. Either the conclusion necessarily follows from the admitted truth of the premises, or it does not. In the former case, all reasonings are in a logical point of view equally necessary; in the latter, all are equally worthless^e. That the inference in Example is material, not formal, appears the instant we attempt to state it in symbolical form: e. g. A and B are both X, A is also Y, therefore B is Y. This reasoning has no force until we know the *matter*, i. e. what particular objects are signified by A and B, X and Y^f.

^b Anal. Pr. ii. 24. 3.

^c Cf. Hegel, Werke, vol. v. p. 151.

^d Introduction to the Analogy.

^e See Sir W. Hamilton, *Edinburgh Review*, No. 115. p. 225.

^f Kant classes imperfect induction and analogy as *sylogisms of the judgment*, and describes them as furnishing a *logical presumption* of their conclusion. But this classification ought to have excluded them from Formal Logic.

The Example is sometimes loosely called reasoning from *Analogy*[†]. This term, however, properly belongs, not to absolute similarity in any given quality, but only to similarity of relations. Thus Aristotle speaks of an *analogy* between sight and intellect, the one being related to the body as the other to the soul[‡]. And the argument of Bishop Butler's *Analogy of Religion to the Constitution and Course of Nature* may be put into the same form. The difficulties in Religion, natural and revealed, have the same relation to their respective systems, that the difficulties in the course of nature have to the entire system of nature. If then the latter be admitted to proceed from a Divine Author, the difficulties in the two former are not a valid objection against a like origin. This reasoning from Analogy corresponds to what is sometimes called the Induction of Socrates, and to the *παραβολή* mentioned by Aristotle, *Rhet.* ii. 20. 4.¹ Like the Example proper, it has no logical value; its symbolical form being, A is to B as C to D; A is X, therefore C is X. Here it is evident that the premise may be true and yet the conclusion false. Its material value, like that of Example, may admit of any degree, from zero to moral certainty.

[†] See Reid, *Intellectual Powers*, i. 4. Mill, *Logic*, b. iii. ch. 20. Hoffbauer, *Logik*, §. 453. Krug, *Logik*, §. 168.

[‡] *Eth. Nic.* i. 4. 12.

¹ *Παραβολή δὲ τὰ Σωκρατικά.* *Rhet.* ii. 20. 4. Compare the reasoning of Socrates, in the *Gorgias*, p. 460. with the criticism of Boethius, *de Syll. Cal.* lib. ii. *Opera*, p. 600.

NOTE I.

ON THE HYPOTHETICAL SYLLOGISM.

THAT the συλλογισμοὶ ἐξ ὑποθέσεως of Aristotle are not identical with those which, since the time of Theophrastus and Eudemus, have been received in Logic as Hypothetical Syllogisms, is now generally admitted^a. The word *Hypothetical* is never by Aristotle opposed to *Categorical*, but to *Ostensive* (δεικτικὸς^b); and he remarks that the *Syllogistic portion* of the reasoning in Hypothetical Syllogisms is ostensive, and requires no reduction; but that the determination of the original question is not effected by Syllogism at all, and cannot be exhibited in Syllogistic form. The meaning of this may be clearly explained by examples.

Of the Hypothetical Syllogism, two principal kinds are mentioned by Aristotle. One is the ἀπαγωγή εἰς τὸ ἀδύνατον: the other is a Syllogism of which the conclusiveness depends entirely on agreement between two contending parties, and which is therefore chiefly serviceable in dialectic disputation. The latter may be exhibited as follows.

The original question being to prove that some A is not B; the contending parties agree to the *hypothesis*, that if some A is not C, it is not B. The reasoning proceeds thus:

No X is C;	} (συλλογισμὸς ἐξ ὑποθέσεως.)
All X is A;	
Therefore, Some A is not C.	

And then, *in consequence of the previous agreement, but not of the Syllogism*, it is allowed that some A is not B.

^a We must except M. St. Hilaire, who professes to discover the ordinary Hypotheticals in Anal. Prior, i. 44. 1. But the text of Aristotle will hardly warrant the assertion.

^b See Anal. Pr. i. 23. 2.

The Syllogism in form is an ordinary Categorical in the third figure; the Conclusion, however, not being the original question, but the antecedent of a Hypothetical Proposition, of which the question is the consequent^c.

The ἀπαγωγή εἰς τὸ ἀδύνατον is also Categorical, so far as it is Syllogistic. In this, the Conclusion syllogistically proved is a falsehood; the original question being inferred only by Hypothesis, because a falsehood results from the assumption of its contradictory^d. The *Hypothesis* in this case is, that the contradictory is true^e. Thus, if it be required to prove that some A is not B, we reason from the assumption of the contradictory,

All A is B;	}	(συλλογισμὸς ἐξ ὑποθέσεως.)
All C is A;		
Therefore, All C is B.		

^c Ἐν ἁπασι γὰρ ὁ μὲν συλλογισμὸς γίνεται πρὸς τὸ μεταλαμβάνομενον, τὸ δ' ἐξ ἀρχῆς περαίνεται δι' ὁμολογίας ἢ τινος ἄλλης ὑποθέσεως. Anal. Pr. i. 23. 11. Τὸ μεταλαμβάνομενον is explained by Alexander as applying to the conclusion of the syllogism, because it is taken in a different manner from that in which it was originally enunciated; being at first part of a conditional agreement, and afterwards a categorical conclusion. For this reason, the syllogism is said to be κατὰ μετάληψιν. Anal. Pr. i. 29. 5. Were it not for this authority, it would seem simpler to interpret μετάληψις merely "change of question;" the disputant turning from the original question to the proof of another on which it is supposed to depend. Concerning the other kind of hypothetical syllogisms mentioned in the same passage, those κατὰ ποιότητα, we have no data for even a plausible conjecture. M. St. Hilaire's explanation is forced. Philoponus, (Scholia, p. 178, b. 9.) says it is a syllogism, ἐκ τοῦ μᾶλλον, ἢ ἐκ τοῦ ἥττον, ἢ ἐκ τοῦ ὁμοίου, which probably originated the explanation of Burgersdyck, *Inst. Log.* ii. 14. "Quo scilicet probatur quod minus probabile est, ea conditione, ut probatum sit quod magis probabile est."

^d Anal. Pr. i. 23. 8. Πάντες γὰρ οἱ διὰ τοῦ ἀδυνάτου περαίνοντες τὸ μὲν ψεῦδος συλλογίζονται, τὸ δ' ἐξ ἀρχῆς ἐξ ὑποθέσεως δεικνύουσιν ὅταν ἀδυνάτον τι συμβαίνει τῆς ἀντιφάσεως τεθείσης. I have substituted a mere symbolical syllogism for the instance given by Aristotle, on account of its intricacy, and the length requisite to expand it. The reader will find it explained by Waitz, vol. i. p. 430.

^e Anal. Pr. i. 29. 3. Πάλιν εἰ δεκτικῶς συλλελογίσται τὸ Α τῷ Ε μηδενὶ ὑπάρχειν, ὑποθεμένοις ὑπάρχειν τινὶ διὰ τοῦ ἀδυνάτου δευχθήσεται οὐδενὶ ὑπάρχον.

The Conclusion being supposed to be a known falsehood.

This mode of reasoning, as exhibited by Aristotle, does not directly appear in the same form as the former. For in this the hypothesis is a *premise*; the conclusion being the impossibility which has not been previously enunciated. In the former, the premises are both new assumptions; the conclusion being the antecedent of the conditional proposition which was agreed upon as a hypothesis. Both, however, agree thus far, that the syllogistic portion of each does not differ in form from an ordinary Syllogism; and that in neither is the original question syllogistically proved.

The notices of these Syllogisms in Aristotle are, it must be confessed, sufficiently scanty. Thus much, however, may fairly be gathered. Firstly, that, as regards form, they are merely the common Categorical Syllogisms applied to a particular purpose. Secondly, that their conclusiveness, as regards the original question, is by way of *material*, not of *formal*, consequence. The syllogism by agreement obviously refers to dialectic disputation, and furnishes the grounds for a mere *argumentum ad hominem*, in consequence of a previous admission. Apart from this special application, which does not appear in the syllogism, the proof amounts to this:

No X is C;

All X is A;

Therefore, Some A is not C.

Therefore, (by material consequence,) Some A is not B.

In the ἀπαγωγή εἰς τὸ ἀδύνατον, the proof is of the same character. It has indeed no special reference to Dialectic, and is frequently employed in demonstration[†]; Aristotle's

[†] For the principle of contradiction may be assumed as self-evident, without any convention between disputants. And in this lies the principal

own example being taken from Geometry. But still its connexion with the original question is not formal, but material; for we assume,

All A is B;

All C is A;

Therefore, All C is B.

And this conclusion, from material grounds, we know to be false. We also know (materially again) that the minor premise is true; and all that is logical in the process is the consequent decision that the major must be false, and hence, by the principle of contradiction, that the original question is true.

But one step only is wanting, to convert these material consequences into formal ones. We have in the συλλογισμὸς ἐξ ὁμολογίας clearly the germ of the Conditional Syllogisms of Theophrastus. It needs but to commence with the original hypothesis, not as a mere dialectic convention, but as a proposition having its own objective value, and we have at once a distinct form of argumentation, to which the Aristotelian specimen is related merely as a prosyllogism supporting one of the premises. This done, no great sagacity is required to see that the prosyllogism may in this, as in any other case, be omitted or not, according to the material character of the premise which it supports.

To the ἀπαγωγή εἰς τὸ ἀδύνατον may in like manner be traced the origin of the Disjunctive Syllogism. The most natural proceeding in this case is to state the two contradictory propositions as alternatives, one of them being disproved by a prosyllogism.

Either Some A is not B, or All A is B; in which case

All C is A;

Therefore, All C is B.

difference between the *deductio ad impossibile* and the syllogism of agreement. See Anal. Pr. i, 44. 3.

This conclusion being manifestly false, we have no choice but to admit the other alternative. The pro-syllogism in this case, as in the former, may be omitted, if the falsehood of the alternative is evident without it. We have thus the Disjunctive Syllogism.

We may agree therefore with M. St. Hilaire thus far, that, though the form of the Hypothetical Syllogism is not explicitly exhibited in the extant writings of Aristotle, we have nevertheless the data from which it needs but one step to develop it. Whether that step was taken by Aristotle himself in a lost work, or supplied by his disciples, is a point of little consequence; though external testimony is decidedly in favour of the latter supposition.

Far more important, in a logical point of view, is the inquiry whether the hypothetical syllogism, by whomsoever analysed, is a legitimate addition to the forms of reasoning acknowledged in Aristotle's *Organon*; and consequently, whether its omission can fairly be censured as a deficiency in that work. On this question, I find myself compelled to hold an opinion different from that of the Logicians whose views have been mainly followed in the present work.

By Kant and his followers, the Hypothetical Proposition is described as representing a form of judgment essentially distinct from the Categorical; the latter being thoroughly assertorial, the former problematical in its constituent parts, assertorial only as regards the relation between them. Two judgments, each in itself false, may thus be hypothetically combined into a single truth; and this combination cannot be reduced into categorical form*. The Hypothetical Syllogism, in like manner, is a form of reasoning distinct from the cate-

* See Kant, *Logik*, §. 25. Krug, *Logik*, §. 57. Fries, *System der Logik*, §. 32.

gorical and not reducible to it, being based on a different law of thought, namely, the Logical Principle of Sufficient Reason, *a ratione ad rationatum, a negatione rationati ad negationem rationis valet consequentia*^h.

Of this principle, as applied to judgments, I have elsewhere remarked, that it is not a law of thought, but only a statement of the necessity of some law or otherⁱ. As applied to syllogisms, it has the same character. It states the fact, that whenever a condition, whether material cause of a fact or formal reason of a conclusion, exists, the conditioned fact or conclusion exists also. Thus viewed, it is not the law of any distinct reasoning process, but a statement of the conditions in which laws of nature or of thought are operative. When a material cause exists, its material effect follows, and the phenomenon indicates a law of nature: when a logical premise is given, its logical conclusion follows, and the result indicates a law of thought. *What law*, must in each case be determined by the particular features of the phenomenon or reasoning in question; but a statement of this kind is distinguished from laws of thought, properly so called, by the fact, that it cannot be expressed in a symbolical form: we require the introduction of a definite notion, *Cause, Reason, Condition*, or something of the kind, which is a special object of thought, not the general representative of all objects whatever. The principle in question is thus only a statement of the peculiar character of certain matters about which we may think, and not a law of the form of thought in general.

It is obvious that the relation of premises and conclusion in a syllogism may, like any other relation of condition and conditioned, be expressed in the form of a hypothetical proposition: "If all A is B, and all C is

^h Kant, §. 76, Krug, §. 82. Fries, §. 58.

ⁱ See *Prolegomena Logica*, p. 197.

A, then all C is B:" and the actual assertion of the truth of these premises will furnish at once a so-called hypothetical syllogism: "But all A is B, and all C is A, therefore all C is B." This was observed by Fries, who hence rightly maintains that analytical hypothetical judgments are formal syllogisms^k. It is strange that, after this, he should not have gone a step further, and discovered that synthetical hypothetical judgments are assertions of material consequences. The judgment, "If A is B, C is D," asserts the existence of a consequence necessitated by laws other than those of thought, and consequently out of the province of Logic. The addition of a minor premise and conclusion in the so-called hypothetical syllogism, is merely the assertion that this general material consequence is verified in a particular case.

The distinction so much insisted on by the Kantians, of the *problematical* character of the two members of a hypothetical judgment, is, like the whole Kantian doctrine of modality, of no consequence in formal Logic. All formal thinking is, as regards the material character of its objects, problematical only. Formal Conception pronounces that certain objects of thought may possibly exist, leaving their actual existence to be determined by experience. Formal Judgment decides on the possible coexistence of certain concepts; and Formal Reasoning, on the truth of a conclusion, subject to the hypothesis of the truth of its premises.

To state that this hypothesis is in a certain instance true, adds nothing to the *logical* part of the reasoning, but only verifies the empirical preliminaries which the Logician in every case assumes as given. To exhibit a formal consequence hypothetically, is only a needless reassertion of the existence of data which the act

^k *System der Logik*, §. 44.

of thought presupposes. To exhibit a material consequence hypothetically, is not to make it formal, but only to state that, in a certain given instance, a consequence not cognisable by Logic takes place. The sequence of "C is D," from "A is B," is not one whit more logical than it was before; it is only stated to take place materially in the present case.

The omission of hypothetical syllogisms has frequently been blamed as a defect in Aristotle's *Organon*; and his French translator takes some fruitless pains to strain his text, in order to make out that he does in fact treat of them¹. If there is any truth in the preceding observations, it will follow, that Aristotle understood the limits of Logic better than his critics; and that his translator had better have allowed the omission as a merit than have attempted to deny it as a fault. When the hypothetical proposition states a formal consequence, the reasoning grounded upon it may always be reduced to categorical. When it states a material consequence, it states what the Logician, as such, cannot take into account. Aristotle is therefore quite right in saying, that in this case the conclusion is not *proved*, but *conceded*^m. Syllogism may be employed as a logical proof of the antecedent: the consequent is admitted to follow on grounds which the Logician, as such, does not investigate, but which may be warranted by the principles of this or that material science.

The true character of hypothetical reasoning is lost sight of in the examples commonly selected by Logicians, which have for their subject a *proper name*, and indicate, not a general relation of reason and consequent between two notions, but certain accidental circumstances in the

¹ St. Hilaire, *Logique d'Aristote Traduite en Français*, Preface, p. lx.

^m *Anal. Prior.* i. 23. 11.

history of an individual. The adoption of this type has led to the logical anomaly, that the propositions of a hypothetical syllogism are generally stated without any designate quantity; whereas it is obvious that, wherever *concepts* are compared together in any form of reasoning, two distinct conclusions may follow, according to the quantity assigned. For example, to the premise, "If men are wise, they will consult their permanent interests," we may supply two minors and conclusions, in the constructive form, according as we affirm the antecedent of *all* men or of *some*. It thus becomes necessary to distinguish between two different kinds of apparent hypothetical syllogisms, those in which the inference is from a general hypothesis to all or some of its special instances, and those in which a relation between two individual facts is assumed as a hypothesis leading to a singular conclusion. The former contain a general relation of determining and determined notion, which may always be expressed in three terms; the occasional employment of four being only an accidental variety of language. Thus the general assertion, "If any country is justly governed, the people are happy," is equivalent to, "If any country is justly governed, it has happy people." This we may apply to special instances; *all countries, some countries, or this country*, being asserted to be justly governed: and this is properly *hypothetical reasoning*. The latter denote only a material connection between two single facts, either of which may, to certain minds possessed of certain additional knowledge, be an indication of the other; but the true ground of the inference is contained in this additional knowledge, and not in the mere hypothetical coupling of the facts by a conjunction. This is not hypothetical reasoning; i. e. it is not reasoning *from the hypothesis*, but from

other circumstances not mentioned in the hypothesis at all^a.

It thus appears, that the only hypothetical judgment which can be employed as the real major premise of a syllogism, may be expressed in the form, "If any A is B, it is C," where A, B, and C represent concepts or general notions. The complete categorical equivalent to this is, "Every A which is B is C, because it is B," which admits of two interpretations, according as B stands for the physical cause of the fact, or for the logical reason of our knowing it. In the latter case, the judgment is analytical, and represents a disguised formal consequence with B as a middle term: e. g. "Every man who is learned has studied, because he is learned." Here the notion of study is implied in that of learning, and the major premise is, "All learned beings have studied." The hypothetical proposition thus becomes a complete syllogism, to which the sub-

^a This may be made clearer by an example. The following is cited by Fries, as an instance of a hypothetical proposition, not reducible to categorical form. "If Caius is free from business, he is writing poetry." This may be interpreted to mean either, generally, "whenever Caius is disengaged, he writes poetry;" or, specially, "if he is now disengaged, he is now writing poetry." Under the former interpretation, it is a general hypothesis, which may be applied as a major premise to particular instances: but in this case the true form of the reasoning is, "All times when Caius is disengaged, are times when he writes poetry; and the present is such a time." Under the latter interpretation, it is one of the cases of a material connection of two facts mentioned in the text. Now in this last case, it is obvious that the inference is really made, not from the hypothesis, but from some circumstance known to the reasoner, but not appearing in the proposition. Any man being asked, "Why do you infer that Caius, being now disengaged, is writing poetry?" would reply, "Because he told me he should do so;" or something of the kind. Assuredly he would never dream of replying, "Because *if* he is now disengaged he is writing." In this case then he does not reason *from the hypothesis*, and the expressed propositions do not compose a syllogism.

sequent consequence is related as an episyllogism^o. In the former case, where B stands for a physical cause, the judgment is synthetical, and indicates a material consequence, which it requires some additional knowledge of facts to reduce to formal: e. g. "All wax exposed to the fire melts, because it is exposed." Here, on material grounds, we know that we cannot supply the premise, "All bodies exposed to the fire melt;" but only, "All bodies soluble by heat and exposed to the fire melt." In this case the consequence is extralogical, and requires additional data not given in the thought. But here also, when the judgment in question is employed as the premise of a reasoning, the conclusion follows categorically; though the premise itself cannot, as it stands, be proved by a prosyllogism^p.

The Disjunctive Judgment is usually described as representing a whole divided into two or more parts mutually exclusive of each other; and the Disjunctive Syllogism is supposed to proceed either from the affirmation of one member to the denial of the rest, or from the denial of all but one to the affirmation of that one, by the Principle of Excluded Middle^q.

• Thus:

<i>Hypothetical Syllogism.</i>	<i>Categorical Analysis.</i>
If any man is learned, he has studied:	All learned beings have studied:
Some men are learned;	All learned men are learned beings;
∴ Some men have studied.	∴ All learned men have studied:
	Some men are learned men;
	∴ Some men have studied.

^p The analysis in this case may be exhibited thus:

<i>Hypothetical Syllogism.</i>	<i>Categorical Equivalent.</i>
If any wax is exposed to the fire it melts:	All wax exposed to the fire melts (because exposed):
This wax is exposed to the fire;	This wax is exposed to the fire;
∴ This wax melts.	∴ This wax melts.

The parenthesis indicates the material ground of the major premise.

^q Kant, §. 27 sqq. 77, 78. Krug, §. 57, 84, 85. Fries, §. 33, 59.

This can scarcely be regarded as a correct analysis of the process, unless the two members are *formally stated* as contradictory. The Principle of Excluded Middle asserts that every thing is either A or not A, that of two contradictories, one must exist in every object; as the Principle of Contradiction asserts that they cannot both exist. But if the two members are not stated as contradictories, if my disjunctive premise is, "All C is either A or B," I make the material assertion that All C which is not A is B. If then I reason, "This C is not A^r, therefore it is B," I employ the Principle of Identity in addition to that of Excluded Middle. Again, if I maintain that No C can be both A and B, I make the material assertion that No C which is A is B; and from hence to reason, "This C is A, therefore it is not B," requires not the Principle of Excluded Middle, but that of Contradiction. In the first case, the Excluded Middle does not lead directly to the conclusion, but only to the contraposition of the minor premise. When we deny this C to be A, this principle enables us to assert that it is not-A, and hence to bring the reasoning under the Principle of Identity. But in the second case, in which one of the opposed members is *affirmed*, the ground on which we deny the other, is not because both cannot be false, but because both cannot be true.

It may be questioned whether this second inference is warranted by the *form* of the disjunctive premise. Boethius calls it a *material consequence*^s; and, in spite of the many eminent authorities on the other side, I am still disposed to think he is right. But let us grant for a moment the opposite view, and allow that the proposition, "All C is either A or B," implies, as a condition of its

^r The indefinite minor, "but it is not A," is as objectionable in this syllogism as in the conditional.

^s *De Syll. Hyp.* lib. i. *Opera*, p. 616. Cf. Galen. *Isagoge Dial.* p. 11.

truth, "No C can be both:" Thus viewed, it is in reality a complex proposition, containing two distinct assertions, each of which may be the ground of two distinct processes of reasoning, governed by two opposite laws. Surely it is essential to all clear thinking, that the two should be separated from each other, and not confounded under one form by assuming the Law of Excluded Middle to be, what it is not, a complex of those of Identity and Contradiction. Thus distinguished, the moods of the disjunctive syllogism are mere verbal variations from the categorical form, and may easily be brought under its laws".

¹ Aquinas, Opusc. xlviii. *De Enunciatione*, c. xiv. Krug, *Logik*, §. 86.

² Thus:

<i>Modus tollendo ponens.</i>		<i>Modus ponendo tollens.</i>	
Every C which is not A is B.		No C which is A is B.	
Every	} C is a C which is not A.	Every	} C is a C which is A.
Some		Some	
This		This	
∴ It is B.		∴ It is not B.	

The first is governed by the Principle of Identity, and the second by the Principle of Contradiction.

NOTE K.

ON THE DEMONSTRATIVE SYLLOGISM.

SCIENTIFIC knowledge (*τὸ ἐπίστασθαι*), except when of axiomatic principles^a, requires a conviction of the necessity of the proposition known, and a knowledge of its cause^b. This is produced by the Demonstrative or Scientific Syllogism, which, according to Aristotle's definition, is *ἐξ ἀληθῶν καὶ πρώτων καὶ ἀμέσων καὶ γνωριμωτέγων καὶ προτέρων καὶ αἰτίων τοῦ συμπεράσματος*^c. As the conclusions of this Syllogism are necessary, so must also be the premises; this necessity consists in their being *per se*, in either the first or the second sense of that expression^d. If any of these conditions are not complied with; e. g. if the premise, though containing

^a In the strict sense of the terms, *ἐπίστασθαι* is said of necessary truths which we receive by deduction from higher truths; *νοεῖν*, of those which we receive as evident of themselves. Hence the principal meaning of the corresponding terms, *ἐπιστήμη* and *νοῦς*. The latter, however, or rather its result, is sometimes called *ἐπιστήμη ἀναπόδεικτος*. Cf. Anal. Post. i. 3. 2, 3. i. 33. 1. ii. 19. 7. Eth. Nic. vi. 9. 9. The word *ἄροι*, in the first and last of these places, does not mean, as Pacius explains, simple terms, but, as M. St. Hilaire renders, "les propositions immédiates," i. e. axioms—the limits from which Demonstration commences.

^b Anal. Post. i. 2. 1.

^c Anal. Post. i. 2. 2. By *first* and *immediate* are here meant the same thing; i. e. not demonstrable by a middle term from any higher truth; *γνωριμώτερα* sc. *φύσει*, not *ἡμῖν*, i. e. more universal.

^d Of necessity, three degrees are enumerated, Anal. Post. i. 4. *Κατὰ παντός*, *καθ' αὐτό*, and *ᾧ αὐτό*; usually rendered, *de omni*, *per se*, and *quatenus ipsum*. Of *per se*, as applied to a proposition, four senses are given. 1. When the predicate is part of the definition of the subject. 2. When the subject is part of the definition of the predicate. 3. When existence is predicated of a substance. 4. When the subject is the external efficient cause of the predicate. Propositions in Demonstration proper must be *per se* either in the first or second meaning. See Anal. Post. i. 6. 1.

the cause of the conclusion, is not the first cause, (in which case the syllogism is not ἐξ ἀμέσων*;) or if the premise be an effect and not a cause of the conclusion, or if the premise, though immediate, be a remote and not a proximate cause of the conclusion,—under these circumstances, there is no Demonstration, in the proper sense of the term, as we only know the fact, but not the cause†.

From the above data, the scholastic successors of Aristotle have constructed the following specimen of *demonstratio potissima*.

Omne animal rationale est risibile;
Omnis homo est animal rationale: ergo
Omnis homo est risibilis.

In this syllogism all three propositions are *per se*; the major premise and the conclusion in the second manner; for the subject *homo*, and consequently *animal rationale*, forms part of the definition of the attribute *risibile*: the minor premise is *per se* in the first manner; for *animal rationale*, its predicate, is the definition of *homo*.

In all the propositions of this Demonstration, the predicate and subject are coextensive, and the pro-

* From this it may fairly be inferred that the *demonstratio propter quid sit per causam non primam*, would not alone be regarded by Aristotle as a Demonstration, though it may form a subordinate portion of a complex Demonstration. The ambiguity of the word ἀμέσος, which has partly led to the discrepancies on this point, has been explained already.

† See Anal. Post. i. 18. The distinction between *demonstratio propter quid potissima* and *non potissima* cannot fairly be attributed to Aristotle. The whole of the chapters of the first book of the Posterior Analytics, from the first to the thirteenth inclusive, treat of one kind of Demonstration only. The passages in the *second* book, (ch. 17 and 18.) which seem to favour the distinction, are treating only of the inferior sense of Demonstration, in which it is applicable to τὰ πεφυκέντα ὡς ἐπὶ τὸ πᾶν. Cf. Anal. Pr. i. 18. 5, 6. An. Post. i. 8. 3. i. 30.

position simply convertible. This is requisite, in order to comply with the condition of *quatenus ipsum*.

This Demonstration is exceedingly satisfactory, if we are only allowed to assume all the conditions on which its validity depends; viz. 1. that risibility does flow as an effect from rationality as a cause; 2. that the major premise, in which this causation is asserted, is an axiomatic principle, cognoscible *a priori*, and, as such, carrying with its cognition, the conviction of necessity; 3. that the conclusion is not a mere repetition, in different words, of the major premise; *homo* and *animal rationale* being identical; 4. that any Demonstration acknowledged to be valid can be resolved into the above form.

But waiving the consideration of these questions, which are more easily asked than answered^g, we may find a simpler way of testing the *demonstratio potissima*, by going back to the original authority. For Aristotle's examples are principally taken, as is natural, from the Mathematics; and it is to a Geometrical theorem that the tests of *καθ' αὐτό* and *ᾧ αὐτό* are expressly applied^h. Can it be believed, then, that Aristotle regarded the following as a correct analysis of Geometrical Demonstration?

Every rectilinear figure of three sides has its angles equal to two right angles;

Every triangle is a rectilinear figure of three sides; therefore
Every triangle has its angles equal to two right angles.

^g "Si scrupulosius inquiretur in rem hanc; Num qua sit *essentialis connexio* inter rationalitatem et risibilitatem, quo sit ea *propria causa* hujus, seu *causa per se*; ut Rationalitas, propter ipsam sui *Essentiam*, non possit esse absque Risibilitate; neque hæc absque illa: et quidem *immediata*, absque interventu aliûs considerationis qua connectatur; atque *adæquata*, ut ad omnes rationales extendatur atque ad hos solos: subtilior forsân esset inquisitio quam ut ei facile satisfiat." Wallis, Log. lib. 3. cap. 22.

^h Anal. Post. i. 4. 6. Καὶ τῷ τριγώνῳ ἢ τριγώνον δύο ὀρθαί· καὶ γὰρ καθ' αὐτὸ τὸ τριγώνον δύο ὀρθαῖς ἴσον.

It is not denied that there are passages in Aristotle which may seem to countenance this interpretation; but there are others so palpably inconsistent with it that we are compelled to seek for a new explanation of the former.

In the first place, Aristotle distinctly condemns the assumption of Definitions as a *Petitio Principii*¹, a charge to which the above example is obviously liable; the real question to be proved being, that the three-sided figure has its angles equal to two right angles, whether it is called a triangle or not. In the second place, he says that Demonstration proceeds from *axioms*, and cites as a specimen of the latter, "If equals be taken from equals, the remainders are equal²." These axioms, he says, are common to many classes of objects; but, in any single Science, need only be assumed to an extent commensurate with the object-matter of that Science. The above axiom, for example, is true of other things besides Geometrical Magnitudes, but it is sufficient for the Geometer to assume it as true of these only.

Now if an axiom of this kind be the major premise in a Demonstration, it is manifest that its predicate will also be the predicate of the Conclusion; and that the logical form of that Conclusion will be, not "All triangles are figures having their angles equal to two right angles," but, "Triangles and figures having their angles equal to two right angles are equal to each other."

The immediate Syllogism from which this proposition is proved by Euclid, may be logically stated as follows;

¹ Top. viii. 13. 2.

² Anal. Post. i. 7. 1. i. 10. 2.

"Magnitudes equal to the adjacent exterior and interior angles of a triangle are equal to each other ;

The three interior angles and two right angles are equal to the adjacent exterior and interior angles ;

Therefore, they are equal to each other."

The major premise of this Syllogism is an immediate deduction from the first axiom ; thus :

"Magnitudes which are equal to the same are equal to each other ;

Magnitudes equal to the adjacent exterior and interior angles are equal to the same ;

Therefore, they are equal to each other¹."

That the true syllogistic analysis of Geometrical Demonstrations will always be in this form, the axioms standing as major premises, and the constructions in each case furnishing the proper minor, is evident. It only remains to see whether the text of Aristotle can be accommodated to this interpretation as well as to the other.

With some passages it evidently tallies much better. The places in which the axioms are mentioned in connexion with demonstration have never been satisfactorily explained on the scholastic interpretation².

¹ See Wolf, *Philosophia Rationalis*, §. 492. 551. 552. 798. Mill, *Logic*, vol. i. p. 285. Sir W. Hamilton, *Reid's Works*, p. 702.

² The difficulty is evaded rather than surmounted by distinguishing immediate propositions from axioms, and saying that the latter are employed in demonstration *virtually* but not *actually*. Aquinas, *Opusc.* 48. de Syll. Dem. cap. 6. Cf. Zabarella, in I. An. Post. Cont. 57, 58. Crakanthorpe, *Log. lib.* iv. cap. 1. For in the first place, Aristotle expressly calls the axioms immediate principles of syllogism, and principles *from which* we demonstrate. In the second place, any principle which *virtually* enters and confirms the premises of a demonstration must, if the syllogistic theory be worth any thing, be capable of syllogistic connexion with the premises *which* it confirms : and until this connexion is formally exhibited, no demonstration can be logically complete.

There are others which *prima facie* appear to favour the latter; but, when both interpretations require some straining of Aristotle's language, it is due to the memory of the Father of Logic to give him the benefit of that which does not convict him of flagrant error in the application of his own principles.

Referring back to the Syllogism above given, the major premise may fairly be regarded as *per se*; the subject forming part of the definition of the predicate. For Equality, in the limited sense in which it is employed in Geometry, is a property of Magnitudes; and the latter, as the first and proper subject, will appear in the definition of Geometrical Equality. This definition has been found by some Geometers in the eighth axiom of Euclid; "Magnitudes which coincide are equal;" which, stated in the Aristotelian form, would be, "Equality is the Coincidence of Magnitudes".

The minor premise may also be considered as *per se*. For our definition of a right angle is, that it is half the sum of the two adjacent angles formed by one straight line with another; and our notion of two right angles is that of the sum of the same two adjacent angles. As regards the Conclusion, we need not trouble ourselves with reducing it to the requisite conditions, inasmuch as it is expressly said by Aristotle to comply with them. This compliance does not directly appear in the only form in which the proposition can be syllogistically proved; but in the equipollent statement, that the triangle is a figure of which the interior angles are equal to two right angles. The predicate in this case states a property of the triangle, in the definition of which property, if any be attempted, the proper subject must be included.

^a Cf. Stewart, Elements, Part II. ch. iii. Sect. ii. 2.

A demonstration of this kind certainly falls short, in some respects, of the scholastic model. The predicate and subject in each proposition, *as stated*, are not convertible; and the middle term is not a definition of the minor. But of these requisitions, the first seems to be founded on an erroneous interpretation of Aristotle, according to which that Philosopher is supposed to speak of the Propositions as they appear when strictly enunciated in logical form; not (as seems more probable) of the same Propositions as ordinarily stated by the Geometer°. With regard to the second condition, the text of Aristotle does not warrant its imposition. He says indeed, that the middle term in demonstration must be a definition of the *major*^p; and the precept is intelligible enough, if we rightly understand his theory of the Definition of Attributes. As regards the minor term, it would be difficult to produce a single passage where this condition is clearly laid down as a law of Demonstration; and there is more than one with which it would be no easy task to reconcile it.

If it be thought somewhat over-bold to repudiate positions which so many eminent Logicians have regarded as legitimate deductions from the text of Aristotle; it must be remembered that we have other data for interpretation besides the mere weight of authority. Aristotle's theory of demonstration is principally framed with reference to Geometry: the Scholastic examples, on the other hand, are Physical. The mediæval state of Physical science was perhaps such as to justify, or at least to account for, the Logical and Meta-

° In this way we may interpret such passages as Anal. Post. i. 4. 6. i. 5. 6. ii. 17. 3.

^p Anal. Post. ii. 17. 3. The meaning of this has already been explained. See note C.

physical fictions connected with it, and to give a seeming validity to the most potent demonstration of Risibility as an emanation from Rationality; though that emanation was never dreamed of by Aristotle, and will scarcely claim implicit belief in the present day. But it is not merely because the revolution effected in this branch of Science has invalidated the individual example, that the interpretation is objected to; but because the words of Aristotle himself expressly direct us to another criterion. The Demonstrations of Geometry are still extant in the same form in which they existed in the days of the Stagirite. Though Euclid himself, the oldest remaining Geometer, is a few years younger than Aristotle^q, yet, except on the very improbable hypothesis that he was the original inventor of the whole contents of his *Elements*, that work must be regarded as furnishing a fair specimen of the demonstrations treated of in the *Posterior Analytics*. By this touchstone, Aristotle and his interpreters may be tested. When any modern Herlinus or Dasypodius^r shall exhibit a single demonstration of Euclid in the form of a scholastic *demonstratio potissima*, we may then recognise this foundling of the Schoolmen as the legitimate offspring of their master^s.

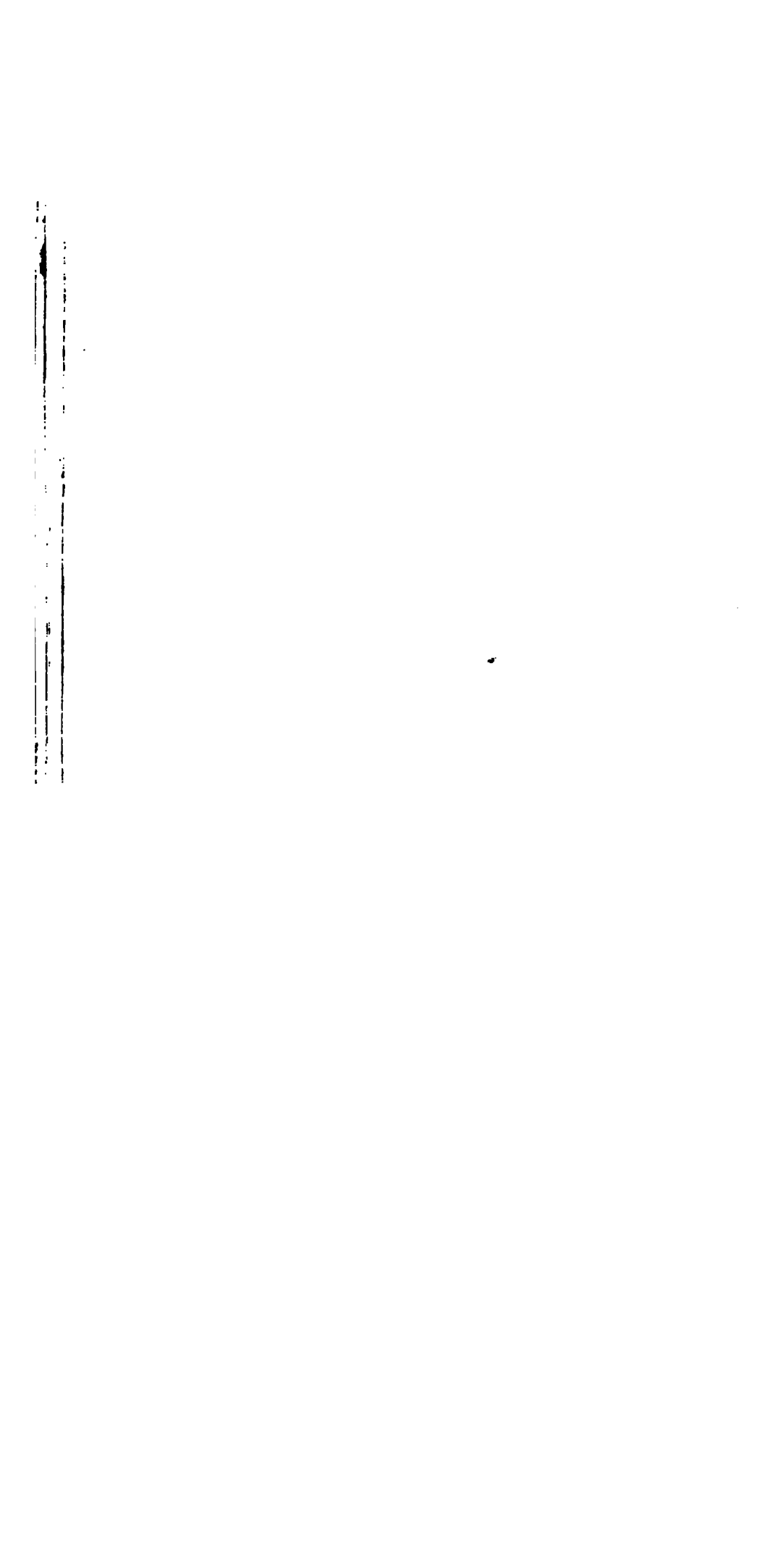
^q Euclid flourished in the reign of Ptolemy Lagus, B.C. 323—283. This period, however, probably corresponds to the close, not to the commencement, of his life. This would make him partly contemporary with, though about thirty years junior to, Aristotle.

^r Of the remarkable work of these two "zealous but thick-headed Logicians," as Sir W. Hamilton calls them, I have not hitherto been enabled to procure a sight; but from the allusion to it by the same author, Reid's Works, p. 702., it would seem that their analysis resembled the one given above. Indeed, it is not easy to conceive how it could be performed in any other way.

^s See on this point the criticisms of Ramus, *Scholæ Mathematicæ*, l. iii. and of Wolf, *Phil. Rat.* §. 408. Both, however, treat the scholastic form as Aristotelian.

Till that is done, we must continue to believe that Aristotle was sufficiently acquainted with the use of his own instrument, to be able to give a correct Logical Analysis of the Demonstration of Geometry.

THE END.



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